



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>

MV
Badminton

Digitized by Google



The Badminton Library

OF

SPORTS AND PASTIMES

EDITED BY

HIS GRACE THE DUKE OF BEAUFORT, K.G.

ASSISTED BY ALFRED E. T. WATSON

FISHING

(SALMON AND TROUT)

PRINTED BY
SPOTTISWOODE AND CO., NEW-STREET SQUARE
LONDON





DONALD IS TOO LATE

FISHING

BY

H. ^{CH}CHOLMONDELEY-PENNELL

LATE HER MAJESTY'S INSPECTOR OF SEA FISHERIES

AUTHOR OF 'THE MODERN PRACTICAL ANGLER'
AND OTHER WORKS

WITH CONTRIBUTIONS FROM OTHER AUTHORS

SALMON AND TROUT



*

WITH NUMEROUS ILLUSTRATIONS

LONDON
LONGMANS, GREEN, AND CO.

1885

Digitized by Google

All rights reserved



21689.

DEDICATION

TO

H.R.H. THE PRINCE OF WALES:

5

BADMINTON: *October 1885.*

HAVING received permission to dedicate these volumes, the BADMINTON LIBRARY of SPORTS and PASTIMES, to HIS ROYAL HIGHNESS THE PRINCE OF WALES, I do so feeling that I am dedicating them to one of the best and keenest sportsmen of our time. I can say, from personal observation, that there is no man who can extricate himself from a bustling and pushing crowd of horsemen, when a fox breaks covert, more dexterously and quickly than His Royal Highness; and that when hounds run hard over a big country, no man can take a line of his own and live with them better. Also, when the wind has been blowing hard, often have I seen His Royal Highness knocking over driven grouse and partridges and high-rocketing pheasants in first-rate

workmanlike style. He is held to be a good yachtsman, and as Commodore of the Royal Yacht Squadron is looked up to by those who love that pleasant and exhilarating pastime. His encouragement of racing is well known, and his attendance at the University, Public School, and other important Matches testifies to his being, like most English gentlemen, fond of all manly sports. I consider it a great privilege to be allowed to dedicate these volumes to so eminent a sportsman as His Royal Highness the Prince of Wales, and I do so with sincere feelings of respect and esteem and loyal devotion.

BEAUFORT.

PREFACE.

A FEW LINES only are necessary to explain the object with which these volumes are put forth. There is no modern encyclopædia to which the inexperienced man, who seeks guidance in the practice of the various British Sports and Pastimes, can turn for information. Some books there are on Hunting, some on Racing, some on Lawn Tennis, some on Fishing, and so on ; but one Library, or succession of volumes, which treats of the Sports and Pastimes indulged in by Englishmen—and women—is wanting. The Badminton Library is offered to supply the want. Of the imperfections which must be found in the execution of such a design we are conscious. Experts often differ. But this we may say, that those who are seeking for knowledge on any of the subjects dealt with will find the results of many years' experience written by men who are in every case adepts at the Sport or Pastime of which they write. It is to

point the way to success to those who are ignorant of the sciences they aspire to master, and who have no friend to help or coach them, that these volumes are written.

To those who have worked hard to place simply and clearly before the reader that which he will find within, the best thanks of the Editor are due. That it has been no slight labour to supervise all that has been written he must acknowledge ; but it has been a labour of love, and very much lightened by the courtesy of the Publisher, by the unflinching, indefatigable assistance of the Sub-Editor, and by the intelligent and able arrangement of each subject by the various writers, who are so thoroughly masters of the subjects of which they treat. The reward we all hope to reap is that our work may prove useful to this and future generations.

THE EDITOR.

PREFATORY NOTE.

PROBABLY few persons who visited the late International Fisheries Exhibition in South Kensington could fail to have been struck by the multiplicity, and, to the uninitiated, complexity of the engines and appliances used in the capture of fish. The observation applies even more to the 'angler'—a generic term that I have a special objection to, by the way, but let us say to the fisherman who uses a rod—than to the 'fisherman' proper, whose weapons are net and hand-line, and who 'occupies his business in great waters.'

In consequence of the growing artfulness of man or of fish, or both, angling has come to be nearly as wide a field for the specialist as doctoring. Each different branch has its own professors, practitioners, and students; and its gospel as preached by apostles, differing often widely from one another, and perhaps eventually breaking away altogether from old tradition and founding a cult of their own. Thus the late Mr. W. C. Stewart, a lawyer of Edinburgh and a 'famous fisher' of the North, may probably be called the apostle of up-stream fly-

fishing, as contrasted with the time-honoured plan of fishing 'down:' fishing, that is, with the flies below rather than above the angler's stand-point. Not that I mean to assert that Mr. Stewart was by any means the first to preach the new doctrine, still less the first to practise it, but that he was the first to 'formularise' it, to give it consistency and shape, and to bring it prominently before the angling world. . . . And even then—and it is a good illustration of the 'specialism' referred to—his book was (statedly) confined to *one* branch of *one* kind of angling for *one* species of fish: 'The Art of Trout Fishing, more particularly applied to Clear Water.' It might have been added 'and in streams and rivers north of the Tweed,' for I believe there is not a word in the book about the rivers or lakes of England, Ireland, or Wales, or how to catch trout in them. I say this in no disparagement of the author or his capital book, but only to illustrate the complexity and 'elaborateness' at which the art of angling has arrived. So far from disparaging, it is probable, on the contrary, that if all writers on fishing had the modesty to confine themselves, as Mr. Stewart did, to subjects they were really personally acquainted with, the gentle art would not be afflicted with a literature containing a greater amount of undiluted bosh—to say nothing of downright 'cribbing'—than probably any printed matter of equal bulk in existence. We want a few more 'Gilbert Whites of Selborne' amongst our angling authors. . . . Poor Stewart! he was a fine fisherman and a right good companion, and pleasant days we fly-fished side by side, with

another famous angler (and politician), alas ! no more—the Johnson of Scotland, as he was well called—I mean Alex. Russel, Editor of the *Scotsman*, and author of the book of ‘The Salmon.’ He and Stewart were two of the finest fishermen that it has ever been my lot to know, and I loved them both well—for ‘like and difference,’ as Mrs. Browning puts it—though Stewart was very wroth with me afterwards and devoted a whole pamphlet to my annihilation, pugnacious ‘moss-trooping Scot’ as he was. . . . No reason that, however, why I should not write his epitaph in the *Field* when he died . . .

I’d give the lands of Deloraine
Stout Musgrave were alive again ! . . .

But, some one asks ‘Why do you not practise what you preach ? You eulogise monographs, and you write books yourself which embrace every variety of angling and “fishey lore” from bait-breeding to salmon-catching.’

Dear critic (forgive the adjective when perhaps you are in the very act of sharpening your ‘scalping-knife’), I do nothing of the sort ; and though it is true I have ‘graduated’ in most kinds of fishing, from sticklebacks upwards, there are many subjects germane to angling, such as fish-rearing—both of *Salmonidæ* and ‘coarse’ fish—fish-acclimatisation, and several special departments of angling itself, where I have need to learn rather than to pretend to teach. Consequently I have thought myself fortunate to be able to secure for these

pages the very kind assistance of the eminent and scientific gentlemen who write in regard to such special subjects with equal felicitousness and authority. Thus the volumes of the Badminton Library confided to me by the Editor and publishers will not lose either in completeness or trustworthiness by my shortcomings.

Frankly, however, this is *not* the reason why I have sought the able co-operation of Major John P. Traherne, Mr. Henry R. Francis, and Mr. H. S. Hall, in dealing with the theory and practice of artificial fly-fishing. The reason is that in some of my former writings I have put forward certain opinions on these subjects which if not 'revolutionary,' may certainly be called in one sense 'radical,' and which have not as yet found general acceptance amongst fly-fishers.

Whether the said opinions are right or wrong matters not. If I had seen any sufficient reason to alter them—at any rate in regard to their main outlines—I should have unhesitatingly avowed it long ago, for I look upon a man who says that he never changes his mind as an ass, or else as sacrificing truth to 'consistency;' but whatever my theories, and whatever may be their ultimate fate, I had, of course, no right or desire to air my hobbies in the pages of the Badminton Library; and I am sure that my readers will, in any case, be the gainers by the substitution of the admirable essays alluded to, written as they are by fly-fishers of long and successful experience and in every sense entitled to be regarded as masters of the craft.

To the Marquis of Exeter, Mr. William Senior,

angling Editor of the *Field*, Mr. Christopher Davies, Mr. R. B. Marston, Editor of the *Fishing Gazette*, and Mr. Thomas Andrews, I am also under the greatest obligation for the very charming and interesting contributions to which their names are attached. I only regret that circumstances should have unavoidably deprived my readers of a promised contribution on salmon fishing from the pen of His Grace the Duke of Beaufort, which would have been warmly welcomed by all fly-fishers.

For the rest, it has been my aim to make these volumes as *practical* as possible ; and if the exigencies of this *rôle* have involved a certain amount of space being devoted to more or less technical matters—which, however necessary and important, are, perhaps, less attractive to the general angling public than to the enthusiastic student—I hope the other part of the programme laid down by the Editor has not been overlooked, and that the following pages will be found to be sufficiently diversified with anecdotes and incidents of sport to redeem them from being hopelessly ‘dull reading.’

H. C.-P.

Erratum.

Page 29, for lines 18 to 21, read : This view is, it will be seen, fully borne out in actual practice ; as proved by the results of published trials and experiments.

CONTENTS.

	PAGE
A CHAPTER ON TACKLE AND FISHING GEAR	I
<i>H. Cholmondeley-Pennell.</i>	
NATURAL HISTORY OF BRITISH SALMONIDÆ	110
<i>H. Cholmondeley-Pennell.</i>	
SALMON-FISHING WITH THE FLY. Also a few Notes on Fly-Fishing for Sea Trout	178
<i>Major John P. Traherne.</i>	
FLY-FISHING FOR TROUT AND GRAYLING; OR 'FINE AND FAR OFF'	257
<i>Henry Ralph Francis, M.A.</i>	
CHALK-STREAM FISHING WITH THE DRY FLY	330
<i>H. S. Hall.</i>	
SPINNING AND BAIT-FISHING FOR SALMON AND TROUT	346
<i>H. Cholmondeley-Pennell.</i>	
THE GRAYLING, AND BAIT-FISHING FOR	394
<i>H. Cholmondeley-Pennell.</i>	
THAMES-TROUT FISHING	410
<i>Henry R. Francis.</i>	
SALMON AND TROUT CULTURE	434
<i>Thomas Andrews.</i>	
INDEX	467

NOTE.

If it is desired to give a trial to the hooks, tackle, &c., recommended in the following pages, it is advised that no change of any kind should be introduced, and that in case of purchases or orders from tackle-shops an exact compliance with the instructions should be insisted upon.

Experimental variations and improvements, so-called, are very apt to produce results the opposite of 'improved.' This is specially true as regards bends of hooks, and the proportions of spinning flights.

FISHING.

SALMON AND TROUT.

A CHAPTER ON TACKLE AND FISHING GEAR.

Tell me what your tackle is, and I will tell you what your bag is.

Angling Paraphrases.

THE saying goes 'A good workman never finds fault with his tools,' but if by this it be meant that he can work as well with bad tools as with good, or produce equally satisfactory results, then it says little for the sagacity of those who made the proverb. It is specially in the more artistic descriptions of work that the importance of good tools is apparent. The fly fisher is a workman in a highly artistic school, and, if he is to do his work thoroughly well, his tools, that is, his tackle—rods, reels, lines, &c. &c.—must be of the very best.

There are still some 'happy hunting grounds' scattered throughout the British Islands on which 'the shadow of the rod or glitter of the bait' has but seldom fallen. Small mountain lochs and moorland streams wherein fish are so guileless and simple in their habits that they will rise with delightful confidingness at the most rudimentary specimen of the artificial fly, offered to them in the least attractive manner. Such spots I have met with where it took weeks to impress upon its trout the melancholy fact that 'men were deceivers ever,' and where day after day the veriest bungler might fill his

creel, and, for that matter, his pockets and his wading boots, with the unsuspecting *fario*, which came up gaily to his flies, three or four at a time, in blissful ignorance and apparently undiminished numbers. Such spots, however, are becoming rarer year by year. Even the most sequestered waters are now sought after, and generally found out, by the indefatigable tourist or the lessees of the sporting rights; and the inhabitants of such waters, however unwilling to be taught, are receiving the benefits of a sort of 'compulsory education' that is gradually opening their eyes to several little things going on in the wicked world around, with which it is to their advantage to be acquainted.

There are, of course, and probably always will be, degrees of advancement in 'trout knowledge.' The streams of Scotland and Ireland can never, in our time at least, be fished to the same extent as those of England, and especially of our southern counties. And it is very fortunate that it should be so, for many a man whose trout-fishing experience has been attained principally amongst the Scotch and Irish lakes and rivers, and who, not unnaturally, perhaps, considers himself a highly artistic performer, would be literally 'nowhere' if suddenly transferred with the same tackle and mode of fishing to the banks of the Itchin, the Test, or the Driffield Beck. Instead of finding comparatively few trout and those under-fed, and predisposed to at least regard his lure with a friendly eye, he would see a water literally teeming with pampered and, therefore, highly fastidious, fish, whom his first appearance on the bank sent flying in a dozen different directions, and who, when his saturated nondescript did happen to pass over their noses, moved not a responsive muscle, and by their attitude conveyed the general idea of what Lord Randolph Churchill would call ineradicable superciliousness. . . .

But these are the products of 'centuries of civilisation,' and the ultimate outcome of the theory of the survival of the fittest !

In regard to salmon as well as trout the principle of the 'higher education' also holds good, although not quite in the

same degree as in the extreme cases above referred to, inasmuch as such abodes of bliss in regard to salmon have unfortunately long ceased to exist either in the British Islands or anywhere else within comfortable travelling range of Charing Cross. Every year the rent of a salmon river goes up; already it is but little less than that of a grouse moor, and what it may eventually come to, if we are not all ruined in the meantime, doth not yet appear.

Naturally, those who pay so dearly for their mile or half-mile of salmon water make up their minds to get the utmost possible out of it in the way of sport. The pools are assiduously fished whenever the water is in 'possible' condition. Often they are fished over two or three times a day, and sometimes by two or three different rods; and the consequence is that, at any rate after having been in the fresh water for some little time, and successfully resisted the first seductions thrown in his way, the salmon becomes much more shy and wary, and untemptable by fly or bait unless presented in the most enticing fashion.

To this end the refinement of every part of the fishing gear is one of the principal, indeed, the chief means. Like his 'star-stoed' cousin of the chalk streams, he scrutinises with a practised glance the object which is glittering before his eyes; and, however attractive may be the lure, if the 'line of invitation,' as some one calls it, with which it is presented be coarse or clumsy, or of flattened and, therefore, non-transparent gut, it is ten to one that he will 'decline with thanks.' In short, as 'fine and far off' might be taken, in the case of the trout fisher, as the pass word to success, so 'neatness and strength' should be the shibboleth of the salmon fisher.

I make no apology, therefore, for dwelling in some detail upon all that constitutes the perfection of the fly-fisher's equipment.

In Vol. II., where the tackle for pike and float fishing is referred to, I begin with the rod, and end, I think, with the hook. In the present instance I propose to begin with the

hook and end with the rod, as the hook is relatively more important in the case of the fly-fisher than of the float-fisher, and greater strides and innovations have been made in it of late than in any other branch of fishing tackle. There have, of course, been also the usual controversies of the rival inventors, or claimants to be such, into the merits of which I do not propose to enter in these pages, but rather simply to notice the inventions themselves where they appear to be of value.

To take salmon hooks first.

Two great and comparatively recent¹ improvements stand out boldly from amongst all minor matters connected with the subject of salmon hooks and their manufacture. The first is the substitution of eyes or loops of metal for the old-fashioned gut loops, and the second the employment of double hooks brazed together, which will, in many cases, especially for the smaller sizes of salmon fly, be found a great improvement, at any rate in regard to the holding of fish when once hooked. The metal loop, however, is by far the more important of the two inventions as it is of universal applicability.

This loop may be either turned up, or turned down, or 'needle-eyed'—that is, drilled perpendicularly through the end of the hook shank like the eye of a needle.

Whatever disadvantages might be imagined to attach to the turned eye in fine trout hooks, they certainly disappear in the case of the large-sized hooks ordinarily employed in salmon and grilse fishing. The undoubted advantages of the system of metal eyes or loops are, on the contrary, brought out in

¹ The general idea of these improvements is not new, but old. Eyed hooks for trout, if not for salmon also, were known more than a century ago. Such a hook, with a fly dressed on it, is engraved in Hawker's edition of Walton's *Angler, temp.* 1760, and the double salmon hook was described nearly a hundred years earlier still, in the *Angler's Vade Mecum*, published by James Chetnam in 1689. In using the expression 'recent improvements,' I mean that it is only recently these ideas have been so far elaborated and worked out as to become practically available for general use in fly-fishing. Indeed, it was only a few months ago that a writer on the subject asserted 'The eyed trout hook and its gut attachment may be said to be perfected in the *Fishing Gazette* of April 4, 1885, by Mr. Cholmondeley-Pennell's article. But see how many years it has taken to do this!'

strong relief, inasmuch as the two great points on which the eyed hooks claim superiority over lapped-on hooks—namely, strength, and durability of the fly—are clearly more important in the case of very heavy fish, and flies which sometimes cost half a sovereign each. How annoying it is, again, when salmon are rising freely at the fly on the cast to find that the gut is so worn to the ‘unsafe point’ by previous encounters as to necessitate a change, whilst no other specimen of the same pattern, or size, may be, is in the tackle box! . . . And it is almost always at the head of the fly that the fraying-away of the gut first takes place.

For these reasons the balance of argument appears to be in favour of metal-looped salmon hooks—whether turned or needle-eyed; and of turned loops I very much prefer, for the reasons hereinafter explained, loops turned *down* to loops turned up. I shall, however, for the sake of completeness, and to meet differing tastes, give representations of both, with the best modes of attachment, as well as of the straight needle-eye in which there is no turn whatever.



FIG. 1.—NEEDLE-EYED GRILSE HOOK KNOTTED ON TO GUT.

To take the latter first. The engraving (fig. 1) is a facsimile of a needle-eyed grilse or small salmon hook, Limerick bend, with the casting line attached.

This attachment (fig. 2) is of the simplest form, consisting merely of threading the end, A, of the gut (*previously well soaked*), through the eye, B, like thread through a needle, and then making round the central link, C, a double ‘half-hitch,’ D. The latter, having been first drawn quite tight, is then slipped downwards to its proper place by a sort of compound process of pushing and pulling—pushing the knot downwards, that is, towards the hook shank with the one hand, and at the same time with the other pulling the central link.

The preliminary stage of the knot, after the gut has been threaded through the eye, and before it has been tightened and drawn to its place, is shown in the engraving.

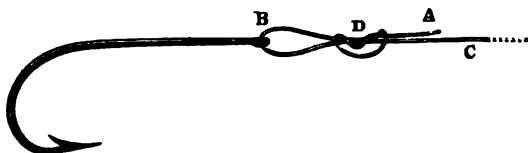


FIG. 2.—MODE OF ATTACHING GUT TO NEEDLE-EYED GRILSE HOOK.

This makes, it will be observed (*vide* fig. 1), an exceedingly small knot, distinctly smaller, in fact, than the knot produced

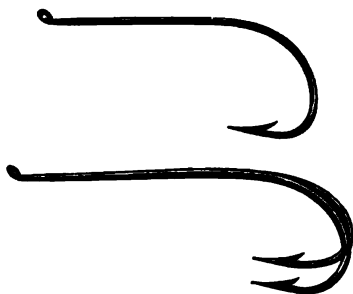


FIG. 3.—TURNED-UP EYED SALMON HOOKS.

by a loop of twisted gut. It is, however, only so long as the gut remains moist and the knot perfectly tight that a correct 'set' of the needle-eyed hook can be relied on, and in the case of large-sized salmon hooks their weight is very apt to overbear the 'clasping' tension of the knot, when, of course, the proper horizontal position of the fly in regard to the line would be lost. I am therefore inclined to think that for all hooks for artificial flies the *loop turned down*—which I originally introduced to public notice in the columns of the 'Fishing Gazette'—is entitled to preference over every other kind of eye or fastening whatsoever; and I should be disposed to em-

ploy it myself for every description and size of salmon and grilse fly.

The engraving (fig. 4) is a facsimile of a double salmon or grilse hook, with a turned-down loop, attached to the main casting line by a single slip knot half completed, and before the final stage of slipping the knot, A, into its eventual position in the metal loop B.

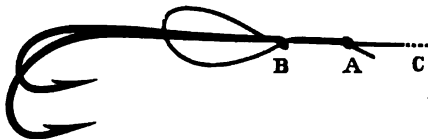


FIG. 4.—TURNED-DOWN EYED HOOK AND SINGLE KNOT.

Fig. 5 represents a single salmon hook with turned-down loop in process of attachment by a double slip knot.

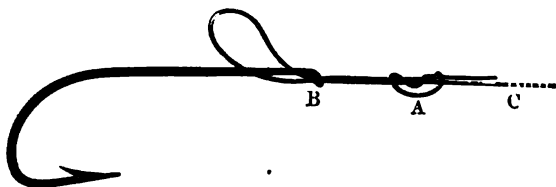


FIG. 5.—TURNED-DOWN EYED HOOK AND DOUBLE KNOT.

A 'single slip' knot is all that will usually be found *actually necessary*, especially with the smaller-sized salmon and grilse hooks; but even in this case—and still more in the case of the larger-sized salmon hooks—a 'double,' instead of a 'single,' knot makes 'assurance doubly sure.' Indeed, I myself use the double slip knot, and recommend its adoption for *all metal-eyed hooks that are too large for the 'Jam Knot' attachment* (hereinafter described)—say for all sizes above No. 1 or 2 (fig. 13). The double slip—A, fig. 5—makes, when artistically tied, a fastening quite as neat as, if not, indeed, actually neater than, the single slip; and is in many other ways preferable.


The following verbal instructions may perhaps assist the tyro, in attaching his casting line to a turned-down eyed salmon hook for the first time.

Take the hook by the bend between the finger and thumb of the left hand, with the eye turned downwards (in the position shown in the diagram, fig. 5) ; then—*the gut being first thoroughly well soaked*—push the end, with a couple of inches, or so, through the eye, B, towards the point of the hook ; then pass it round *over the shank of the hook*, and again, from the opposite side, downwards through the eye in a direction away from the hook-point. [The gut end and the central link will now be lying parallel.] Make the single- (or double-) slip knot, A, figs. 4 and 5, round the central link, C,



FIG. 6.—FACSIMILE OF SALMON FLY WITH TURNED-DOWN METAL EYE ATTACHED TO GUT.

and pull the said knot itself perfectly tight ; then draw the loop of gut, together with the knot, A, backwards (towards the tail of the fly) until the knot presses tightly into and against the metal eye of the hook, B, where hold it firmly with the fore-finger and thumb of the left hand, whilst with the right hand—and ‘humouring’ the gut in the process—the central link is drawn tight, thus taking in the ‘slack’ of the knot. When finished, cut the superfluous gut end off close. [For tying this knot to a turned-up eyed hook *vide* fig. 7.]

To tie a double slip knot : first make a single slip knot, *a*,  and, before drawing close, pass the gut end, *b*, a *second time* round the central link, *c*, and then again through the loop, *a*—when the knot will be like ‘A’ in fig. 5. To

complete it, pull the end of the gut, *b*,—gradually, and very tightly, —*straight away* : in a line, that is, with the central link, *c*.

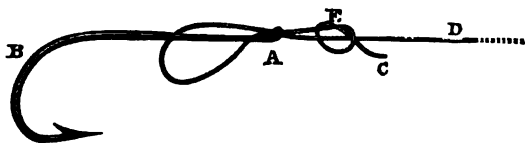


FIG. 7.—SINGLE SLIP KNOT FOR TURNED-UP EYE HALF FINISHED.

The foregoing is also the best knot for attaching the casting line to flies with gut loops, and should be tied as described in the last page for a turned-down eyed hook.

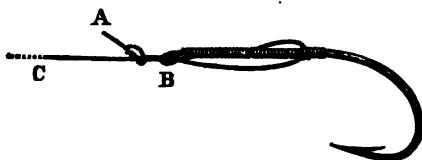


FIG. 8.—ATTACHMENT TO GUT LOOP, WITH SINGLE SLIP KNOT.

The same knot may be produced in another manner—when the fly-loop is large enough—by first completing (separate from the fly) the loop and slip-knot, with the doubled-back end of the casting-line ; and, afterwards, passing, from above, through the fly-loop, the 'apex' of the noose thus formed. The noose is then opened out and turned upwards, so as to envelope and pass over the whole fly, 'lasso-wise' ; the knot is drawn to its place in the gut loop, and the 'slack' gradually taken in. This is the plan adopted by my friend Major G. F. Whittingstall, than whom I know no better or more thoroughly practical salmon-fisher.

There is a mode of knotting or rather of attaching casting lines to gut-looped hooks, which is very commonly employed on account of its extreme facility of manipulation, and the saving of trouble and time in changing flies. It consists in tying a

knot at the end of the gut, and then passing the knotted end first through the loop from below, and, after giving it one turn round under the hook shank or loop, finally passing the knotted end under the central link, and drawing the latter tight. It is in fact the same fastening recommended farther on for attaching gut to turned eyed trout flies, *plus* the knot at the end of the line. Excellently well as this knot answers for hooks of the smaller sizes, as hereafter described, it does not and never can make a thoroughly 'ship-shape' knot for a salmon fly, inasmuch as the latter when thus fastened invariably hangs—and therefore, of course swims—out of the horizontal: in other words *head*



FIG. 9.—FACSIMILE OF KNOT TO GUT LOOP OF FLY COMPLETE.

downwards. If, on the contrary, the gut is passed through the loop from above and the turn taken over the hook shank, an opposite but equally inelegant effect is produced; the fly 'cocks up,' and might swim in almost any position conceivable, except the horizontal. There are several variations of this fastening; but I cannot say that I ever met with one entirely satisfactory for salmon flies. The best knot 'all round' is, without doubt or question, that shown in the diagram (fig. 8).

Neither this nor any other knot, however, tied on loops of twisted gut—as commonly used—is so small and neat as that tied on a properly constructed loop of metal. This will be readily seen by reference to diagrams 10 and 11, which contrast,

in facsimile, the same knot tied with a metal loop and with a twisted gut loop on an extra-large double salmon hook. The strands of salmon gut used were of equal stoutness.



FIG. 10.—GUT KNOTTED ON TWISTED-GUT LOOP.



FIG. 11.—GUT KNOTTED ON METAL LOOP.

In order, however, to get a perfect result—that is, that the hook shank should stand in a line true with the central link of gut—it is necessary that the eye of the hook should be turned, up or down, at the inclination shown (figs. 5 and 13)—*something over half a right angle* ; and that the loop should ‘start,’ so to speak, direct from the shank—without, that is, any intermediate bending upwards (or downwards) of the shank end, or other deviation from the true horizontal. If this is not strictly adhered to the result will be that the line of the gut will not be true with that of the hook shank, and the fly will not swim properly. An illustration of this is seen in the engraving

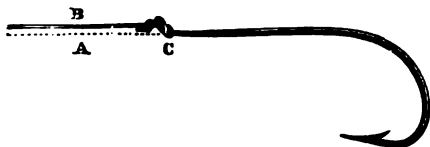


FIG. 12.—DEFECTIVE TURNED-UP EYE.

(fig. 12), where the very slight ‘turn up’ of the end of the hook shank itself (c) has been sufficient to produce the result indicated—the lower, or dotted, line (A) representing the correct and true line of the gut, and the upper, or solid, one (B) its actual

position when attached to the defective loop. Such a hook as this must obviously lose in penetration—as well as in ‘flotation’ or ‘swimming’ qualities. Again, if the turned eye is set at an angle either greater or less than that shown in the engraving—that is, if it is either ‘broader’ or ‘narrower’ than

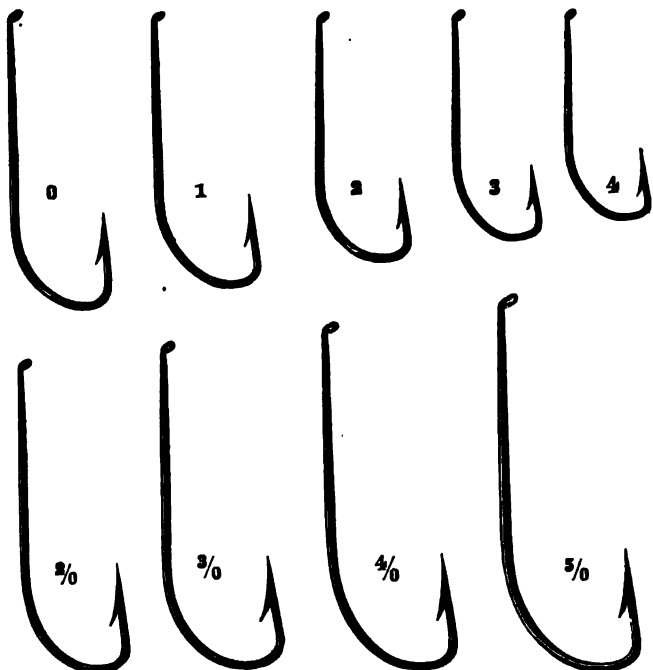


FIG. 13.—‘PENNELL-LIMERICK’ BEND SALMON AND GRILSE HOOKS, TURNED-DOWN LOOPS.

it should be—a corresponding deviation in the straightness of the set of the fly, upwards or downwards, will be the result.

Looked at from the fly-fisher’s—though not perhaps from the fly-vendor’s—point of view, the advantages of salmon hooks with metal eyes, made as above, contrasted with flies with gut loops or tied on to the central link, are so great and so obvious

that I cannot doubt their absolutely superseding the latter in the long run.

Although for the sake of not doing too great violence to my reader's nerves, I have here dealt at some length, and I hope completeness, with the question of hooks with metal eyes

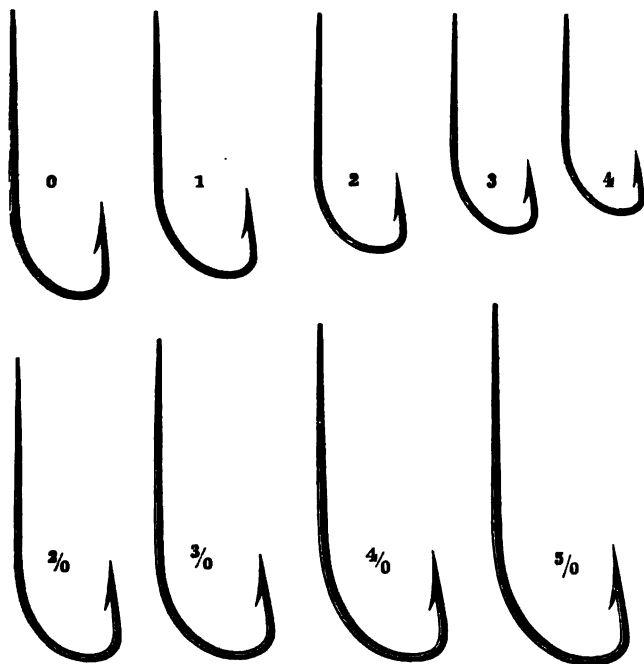


FIG. 14.—'PENNELL-LIMERICK' SALMON AND GRILSE HOOKS, PLAIN.

turned up, and also needle-eyed, as those with which the public mind is partially familiarised, yet were I to make a full confession of faith, I am clearly of opinion that our preference ought, on several grounds, to be given to loops turned down and not to loops turned up. The turned-down loop certainly makes it more difficult—I may say makes it impossible—for

the fly to lose its correct horizontal position, or turn ever so slightly 'head down,' and the line of 'pull' when the hook point strikes a fish's mouth is more direct and therefore more deadly. It produces, in fact, in this respect the same result, in a somewhat greater degree, that is arrived at by lapping the gut underneath instead of on the top of the shank of the hook—a point, by the way, never to be lost sight of by the fly tyer.

Turned-down looped hooks, as well for sea trout as for grilse and salmon flies, have been made to my patterns and instructions by Messrs. Harrison & Bartleet, of Redditch, who are now manufacturing them, under the name of the 'Pennell-Limerick' bend, in various sizes, both single and double. They also manufacture them *plain* (as shown in the diagram)—without metal eyes or loops. The bend of these hooks, which is a variation of existing recognised bends, is one that I think will commend itself to the practised eye without much argument. The bend has been designed to combine in a mechanical form the three great requisites of penetration, holding power, and 'flotation.' The last-named, which sounds rather Irish, is a question of the general *contour* of the shank. It will be seen that in the patterns in the diagram the hook shank itself—or rather that part of it on which the fly is tied—is very nearly straight, whilst in the Limerick bend the shank is commonly slightly more curved, or, as it is termed, hog-backed, which when exaggerated, as it frequently is in the so-called Limerick hooks, supplied by the fly tyers, has the effect of preventing the fly swimming or floating perfectly straight, and, indeed, when the stream is strong,



FIG. 15.—DEFECTIVE OR HOG-BACKED-SHANKED HOOK.

an excessive 'hog-backedness' will not unfrequently cause it actually to spin.

An exaggerated example of this is shown in the cut.

The penetrating power in my bend is obtained by the angle at which the point and short side of the hook stand in regard to the hook shank, towards which, it will be observed, they are inclined. In other words, the point turns somewhat inwards, so that when it pricks the mouth of the salmon the probabilities of its penetrating are greatly increased. *Cæteris paribus*, the penetrating power of any hook will be greater in proportion as the angle of impact—the angle, that is, at which the point of the hook strikes the fish's mouth—coincides with the direction of the applied force [i.e. in this case, 'the pull' of the line].

The diagrams (fig. 16) are illustrations of defective hooks. They embrace nearly every vice which, mechanically speaking,

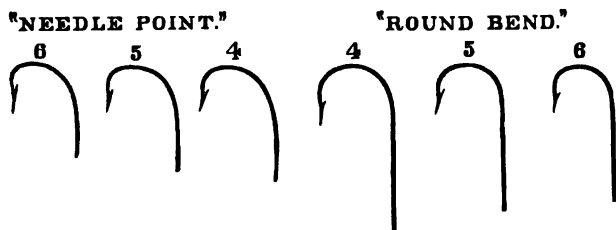


FIG. 16.—DEFECTIVE HOOK BENDS.

can be imported into a hook. And yet they are taken, *facsimile*, from a hookmaker's catalogue (I forbear to give the name) as illustrations of what in his opinion hooks ought to be! If one of these abortions, say No. 4 or 5 'needle point,' so called, were attached to gut and the point pulled in the ordinary way against a piece of cork—which represents fairly well the inside of a fish's mouth—I doubt very much if it could by any possibility be made to penetrate; the hook point would, in fact, strike the fish's mouth horizontally instead of vertically.

As I have observed in the second volume, *à propos* of the bends of triangles, the stupidity of hookmakers in their own business can hardly be imagined except by those who have, as I have had, day after day, and week after week, to drive, if it

were possible, some few ideas of mechanical principles into their heads. Even when one has at last succeeded in producing a comprehension of what is required the difficulty is only half vanquished ; the other half, which remains unfortunately as an ever open source of annoyance, is that when they have got at the patterns you want they will not keep to them. About ten years ago I brought out a pattern of hook which still passes under my name, and which was constructed, at any rate so far as the earlier specimens were concerned, upon mechanical principles ; and especially for the smaller sized hooks, I believe it was not easily to be beaten.

But in vain I hoped that my troubles were then ended. Ever since, hookmakers, who have professed to manufacture my patterns, have vied with each other in diverging in every direction from the original model, and in each case I believe I may truly say the divergency has been to spoil some good feature in the hooks, or to import some mechanical defect. I really think, however, that I have at last found in Messrs. Harrison & Co., the well-known hookmakers, of Redditch, a firm both sufficiently enterprising and painstaking to be willing to carry out my ideas strictly, and, as I would fain hope, though almost against hope, to adhere to the patterns when once settled.

It may appear that I am attaching, perhaps, undue importance to such minute details as to the bends, &c., of hooks, but yet I think this view will not be entertained when it is borne in mind that 'the whole art and paraphernalia of angling have for their objects, first, to hook fish, and, secondly, to keep them hooked.' The difference in the penetrating powers alone of different bends of hooks is something enormous ; between the extremes of goodness and badness it amounts to certainly not *less* than a hundred per cent.

As I have practically demonstrated by experiments explained in former essays, the best of the ordinary standard patterns for small hooks was undoubtedly the 'sneck'—or I should rather say, some of the shapes in which it was manufac-

tured, as others were very defective. It has, however, one radical defect looked at from a mechanical point of view, namely, that the point side is crooked or turned sideways, the 'penetration' diminishing, of course, in proportion as the point is turned from the direction of the applied force. This is the theory. In practice, the results of my experiments fully bear it out, and though it may occasionally happen, and I dare say does, that the turned-out point of the 'sneck' bend hooks will scratch or prick a fish's mouth when the straight bend would not do so, yet in every real essential of a killing hook I am satisfied that the un-turned-out point is to be preferred for filling the fly fisher's creel.

For salmon flies neither the genuine 'sneck' bend, nor my own variation just described, appears to be popular. One reason of this is that in all hooks of the 'sneck' bend a great strain is put on the top angle at the end of the shank ; and it is at this point accordingly that they have been found to fail in practice. In fact I have known three salmon to be lost in one hour owing in each case to breakages of the hook at the angle in question. I believe that in my old pattern referred to the danger was minimised by slightly thickening the hook at this its weak point, but I cannot help thinking that another reason for the non-adoption of it and other varieties of the 'sneck' bend for salmon flies was owing to the fact that many fishermen consider that the fly looks somewhat 'prettier,' or more artistic, when dressed upon the Limerick or Sproat bends. I have, therefore, endeavoured, as far as possible, to adapt the general outline of these bends to the mechanical requirements of the case, and the outcome has been seen in the salmon hook, fig. 13.

Before taking leave of the subject of salmon hooks, one word about the double hooks for salmon flies. These should be set at an angle of about 40° , and brazed together ; as when 'whipped' they are both clumsy, and, from want of rigidity, lose half their effectiveness. I have no doubt whatever that for salmon hooks, especially of the smaller sizes, the double hook has many great advantages, and I hear that on some rivers,

the Tweed, for example, they are completely driving the single hooks off the water. It is obvious, indeed, that they greatly increase the chance both of hooking and of holding a fish, and against the small additional weight, which may be a slight inconvenience, perhaps, in casting, is to be set the fact that the extra weight has the effect of making the fly swim somewhat deeper, which is a generally desirable result.

In regard to holding powers of salmon hooks there have been several ingenious inventions in the way of extra barbs. One of the simplest of these is shown in the cut (fig. 17).



FIG. 17.
DOUBLE-BARBED HOOK.



FIG. 18.
'SLICED' HOOK.

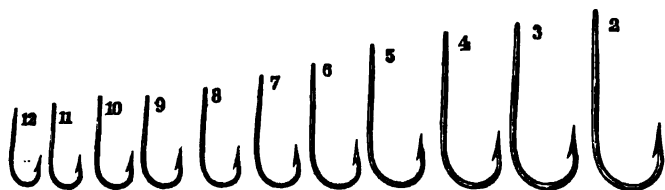
An analogous invention, though with a different object, is that by Mr. R. B. Marston, of the 'sliced' hook. The object is, of course, to prevent the bait which has once been put on from slipping down the shank. It might be useful, perhaps, in fishing with some kinds of bait, and Mr. J. C. Wilcox, the well-known writer on sea fishing, prophesies much success for it in that department. The manufacturers are Messrs. Millward & Son, of Redditch.

Passing from salmon to trout hooks we find that here also great improvements have been made, both in principle and in regard to the actual manufacture of the hooks themselves.

What promises to be by far the most important of these novelties [I use the words in the relative sense, for the idea is not new, but old] is the attaching of the fly to the casting line itself by means of a metal loop or eye. Eyed hooks, whether turned or needle-eyed, are, as I say, no novelty, having

been alluded to by Wheatley and other writers and actually patented as far back as 1866 in several forms by Messrs. Warner & Son. No great attention, however, appears to have been paid to the subject of eyed trout hooks until recently, when the question—confined, so far as these discussions extended, to turned-*up* eyed eyes—has been prominently brought before the angling world in the columns of the 'Field' and the 'Sporting Gazette' by Mr. H. S. Hall, whose article on chalk stream fishing in this volume will, I am sure, be read with great interest by all fly fishers. Mr. Hall has also elaborated and brought to great perfection the system of detached bodied flies, made both of horsehair and india-rubber; and the diagrams of flies illustrative of his article, in themselves more or less novel and original, are dressed on his hooks, some by himself and the rest by Mr. George Holland, 4 Cook Street, Failsworth, near Manchester, who, under Mr. Hall's instructions, has carried this department of fly tying to special excellence.

PENNELL OLD BEND.



ROUND BEND.

Facsimiles of Mr Hall's sizes from 000 to 8—the highest number usually required for trout fishing—of my original

pattern, numbers 1 to 10, as also corresponding numbers of the ordinary Limerick and round bend, are annexed.

LIMERICK BEND.



HALL'S EYED HOOKS.

It is unlucky, however, that hooks never 'come out well,' as the expression is, in wood engraving, and even when, as in the present instance, as well as in the case of my own patterns, the utmost skill and care have been ungrudgingly applied, the results are not in fact nearly equal to the originals either in finish or bend. The utmost that can be done, especially with very small hooks, is by a characteristic sketch to convey to the educated and practised eye a tolerably accurate notion of what the hooks themselves would be. Of course this difficulty is increased in the case of hooks which, like Mr. Hall's patterns, are turned out or deflected at the point.

Mr. Hall informs me that his patterns of turned-up eyed trout hooks are now being manufactured by Messrs. Woodfield & Sons of Redditch.

The gut is knotted to the loop by Mr. Hall in one of several ways, but he gives the preference to that already described for knotting gut on to the metal loops of salmon hooks. The

instructions and diagram (enlarged) are here repeated for the convenience of the reader :

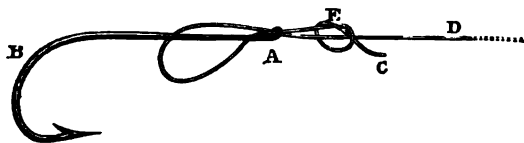


FIG. 19.—MR. HALL'S KNOT FOR TURNED-UP EYED TROUT HOOKS
(MAGNIFIED).

First take the hook in the left hand between the finger and thumb by the hook end, the end of the shank pointing away, then—*the gut being first thoroughly soaked*—pass a couple of inches of it upwards through the loop, A, in the direction of the hook bend, B; then pass it *under the shank of the hook* and again through the loop in a direction away from the hook. [The gut end and the central link will now be lying parallel.] Make a 'single-bitch' knot with the gut end, C, round the central link, D, and pull the said knot itself, E, perfectly tight; then, by a sort of 'pushing-and-pulling' movement already described, and 'humouring' the gut in the process, draw the knot, E, as far down the central link as possible—until, that is, it presses *close under and against the metal loop, A*, and, when it is firmly fixed in this position, cut the superfluous gut off close to the end.

The above knot, however, though undoubtedly excellent when once tied, is in my judgment too complex in practice to be available for the ordinary trout fly fisher; and this was the most serious objection I found to the general introduction of the turned-up eye for small trout hooks, at the time when I first took a part in the controversy. The sort of 'in-and-out' process required to knot the hook to the line by the attachment in question—the only one (N.B.) then made public that produced a fairly correct set of the fly—is difficult enough when carried out on a bare hook or in the angler's *sanctum* after dinner; but the difficulty is increased tenfold beside the trout stream, when, perhaps, a gale is blowing, or the half-thawed frost and a March morning are reminding the fisherman of the old saying about all his fingers being thumbs.

I record this as my individual opinion. The experience of others, who have, perhaps, had larger practice in attaching the

flies, may be different, and as a matter of fact, I am aware that many first-rate fly fishers who use Mr. Hall's eyed hooks profess to experience no inconvenience whatever in connection with the above method of knotting-on of the gut.

With all deference, however, to the skilful and practised fly fishers who can tie the gut on thus to the turned-up eyed hook, I cannot but feel, that my own essays in the matter more nearly represent, in all probability, the difficulties of the ordinary run of trout fishers in dealing for the first time with eyed hooks ; and, following out a suggestion made to me by Mr. H. R. Francis, the accomplished author of 'The Fly Fisher and his Library,' I set to work to get some hooks made with actual needle eyes—that is, eyes drilled straight through the point of the shank as in the case of the needle—by which the inconvenience in question would be overcome. After a good deal of trouble I succeeded in obtaining, through the assistance of Messrs. Warner & Son, of Redditch, specimens of *bonâ fide* needle-eyed hooks of the desired bend and pattern.

In these needle-eyed hooks—which I may mention were manufactured out of actual needles—all the difficulties incident to the complicated nature of the different processes of knotting on the gut were, of course, entirely obviated ; the gut being simply threaded straight through the eye of the hook like a piece of cotton through the eye of a sewing needle, and then being fastened with a double 'half hitch'—the same fastening, in fact, described for needle-eyed grilse hooks, fig. 2, in this chapter.

By this mode of fastening it appeared—first, that the fly would swim perfectly straight, and, therefore, at least as well as with the turned-up eye ; secondly, that the knot and hook eye combined were on the whole smaller ; and, thirdly, that the casting line could be attached to the fly with facility and rapidity even under the most unfavourable conditions of wind and weather.

The point of vital importance in the fastening is the *double hitch* (v) over the central link. This double knot has sufficient

'clasping' power, when once pulled *quite tight*, to keep the fly in its proper horizontal position. If, however, only a single hitch knot were used, its clasping or holding tendency would be inadequate, and the knot would most likely slip round the loop or eye, letting the fly hang or stand out at all sorts of angles with the central link. This will often happen when the gut is quite dry even with the double knot, but when once the knot has been well wetted and pulled down by the finger-nails close and tight against the hook-eye, I have never once found it slip or change its position. The needle-eyes must, however, be properly drilled, like those of needles, *close* to the end of the hook-shank. I can quite imagine that if the eyes were badly drilled, or drilled too far away from the end this result would not be attained. The success of these and all other forms of metal-eyed or looped hooks depends, in fact, very much upon extreme care and nicety in the manufacture.

It may be supposed that the experiments requisite to establish the foregoing facts, remodellings of defective hooks, &c., were no small taxes upon time and patience. At last, however, all seemed to be satisfactorily accomplished. And, having received from the makers the first consignment of my needle-eyed hooks neatly labelled and docketed for ready reference, I fancied my troubles were over, and that I had at length arrived at approximate perfection, in the one item, at least, of metal-eyed trout-hooks. Alas! for the vanity of human hopes, or I should, perhaps, say inventor's anticipations: I found that, as regards the four smallest sizes, 000, 00, 0, and 1, I had only substituted one 'knotting-on' difficulty for another; the eyes of these sizes were so minute that even the finest gut could not be persuaded, without much difficulty (and often not at all), to pass through them. There was nothing for it but to make the eyes of these small sizes in the form of horizontal loops, so that they might still be threaded on to the gut 'needle-wise,' and if not quite so small and neat as the veritable needle-eyes, they would be yet quite small enough for practical efficiency, and would equally overcome

the difficulty of the 'in-and-out' knot fastening. This, it must be admitted, they did very effectually, and I could attach the casting-line to my horizontal loops, even the tiniest sizes, without the smallest difficulty or delay. But somehow my satisfaction at this result was incomplete ; I could not help feeling that a Jenny Spinner tied on a 000 hook had a disproportionately *long* head. But, then, was not this only the neck after all ? And was there ever a fly without a neck ? Anatomically, if not entomologically, the proposition was undeniable ; and yet, somehow, I could not regard my long-headed *diptera* with an eye of entire affection. . . .

At this juncture I happened to stroll into Mr. Farlow's shop, when his representative called my attention to some very delicate and artistic rubber-bodied flies of his dressing, tied on Mr. Hall's turned-up eyed-hooks. I agreed with him cordially as to their manifold attractiveness, yet felt that veracity compelled me to add, ' But the difficulty in knotting on the gut to those turned-up eyes, by the river bank, will, I fear, prevent their ever coming into really general use.'

' Well, sir,' he replied, ' I am not so sure of that. I can show you a way of knotting on the gut that can be done in half a minute, and just as well at the waterside as on this counter.'

I confess I took no pains to conceal my incredulity. He soon convinced me, however, that he was right ; the knot when attached to a fine turned eye, set at the correct angle, as in my patterns of trout hooks, is simply perfect. His method also of facilitating the tying of it was very effective ; he contrived, by an ingenious though simple expedient, to get the feathers of the fly out of the way of the gut whilst the knot was being made, thus obviating one of the principal difficulties that present themselves—or rather presented themselves at that time—in attaching the casting-line to flies with metal loops. This he effected by a sort of shield or ' protector ' made of an oval-shaped piece of thin white leather, or common note-paper, in which, doubled back, the fly was held ; and having a small hole in the centre. Through this hole, before being attached to the gut, the hook-

eye was pushed some little way—sufficient to press back the feathers and leave the eye unencumbered.

The mode of attachment of the gut by the jam knot when using a 'protector' was as follows :—

The casting-line being well moistened, and the fly held in the left-hand *with the loop turned upwards*, push about *two inches* of the gut end upwards through the hook-eye ; pass it round under the hook-shank, and slip the point *underneath* the central gut link between the loop and the head of the fly. Then draw the central link tight, and cut off the superfluous gut end to within a full $\frac{1}{16}$ of an inch of the knot or a little more, according to the size of the fly. Now pull the leather protector completely over the hook and body of the fly backward, and so off. A paper protector can be removed by simply tearing it across.

As a matter of fact I found that this 'jam knot,' as I have christened it from the form of its construction, could, after a little practice, be readily tied without the use of any protector, by merely holding the feathers back, with the hook, between the thumb and first finger of the left hand.

All necessity however for either 'practice' or 'protector' in tying the knot has become a thing of the past, thanks to the admirable invention of Mr. Alex. D. Campbell, who has discovered an entirely new, and, so to speak, 'automatic,' mode of effecting it, which is so perfectly simple and easy of manipulation as at once to put all other methods 'out of court.' The *modus operandi* will be best explained by a reference to the illustrative diagrams, fig. 20, showing (1) the fly (enlarged) in the position for tying the knot, which is seen half finished ; (2) the bare hook (also enlarged) showing the jam knot finished, all but the cutting off of the superfluous gut end ; and (3) the fly, (natural size), with the knot completed.

The following is the verbal formulary :—

First. Take the fly by the head in the position shown, with the eye turned upwards (1) ; pass 2 or 3 inches of the end of the gut casting-line, B, (previously well moistened) through the eye, *towards the point of the hook*, and then, letting go the fly altogether, double back the gut and make a single slip knot, C, round the centre link, D.

Secondly. Draw the slip knot tight enough only to admit of its just passing freely over the hook-eye, and then run it down to, *and over*, the said eye,—when, on gradually tightening (pulling) the central link, the ‘jam knot’ is automatically formed.

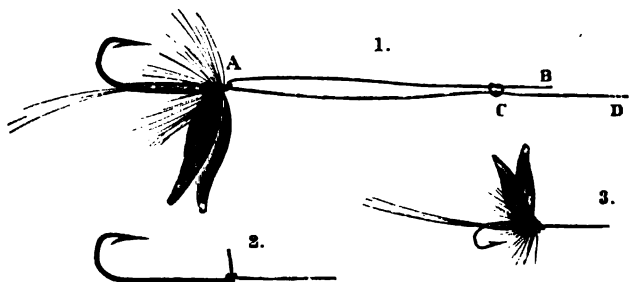


FIG. 20.—‘JAM KNOT’ ATTACHMENT FOR EYED TROUT-HOOKS.

Part 2 of the process is best accomplished by the finger and thumb of the right hand manipulating the slip knot whilst the central link is pulled gently by the three remaining fingers and the palm.

When the attachment is completed and the superfluous gut cut off, it will be found a very good plan to ‘nip’ the end down with the thumb-nail, *in the direction of the hook-bend*—thus further securing the ‘jam.’ This operation may just as well be repeated whenever the flies are examined, which they should be from time to time in order to see that the gut is not frayed anywhere, and that the spare end has not been gradually drawn in too close to the knot—or, in other words, become too short—to be safe.

Nothing can, I think, well be simpler or more effective than the above fastening,¹ which is also, of course, smaller than the ‘in-and-out’ method, inasmuch as there is no knot

¹ ‘A well-known and successful fly-fisher writes to me:—

‘The “jam knot” is the simplest and probably the strongest fastening for trout and grayling flies ever invented; whilst at the same time—owing to the hook-eye having only to be large enough to pass the gut once through it—it is also the smallest and the neatest. . . .

‘The combination of your Turned-Down Eyed hooks with the Jam Knot produces an absolutely perfect attachment, and finally solves the great Eyed-Hook problem.’

of any kind outside the metal loop. It has also the further advantage of being detached in a moment when it is desired to change flies. In order, however, to make the fastening to the best advantage, it is necessary that the loop should, as in the case of the loop in the salmon hooks, be set at a little more than half a right angle, and also that the loop should spring sharp from a perfectly straight shank without any preliminary bending or inclination.

The loop itself should also be as *small* as possible, both for the sake of neatness, and to bring the gut in a true line with the hook shank. A large or a thick loop does not seem to hold equally well, or to float equally straight, and for this reason I have had the loops of all the larger sizes of turn-down eyed hooks—both patterns—made of *tapered* steel. These loops are enabled to be thus made exceedingly minute, which is of the greatest importance in every way, because in the 'jam knot' the gut has only to pass once through the loop instead of twice, and therefore the loop eye can be, and should be, made correspondingly more minute. In all sizes, for trout flies it ought to be just large enough to admit of a medium-sized strand of undrawn trout gut, or a good piece of horsehair, such as is used for roach fishing, being passed readily through it.

In experimenting with different systems of bends and eyes and loops, I have been led to notice that in the case of all small trout hooks with eyes turned *up* there is, after the fly has been soaked some little while, a slight—very slight—deviation in the set of the fly from the true horizontal, and this whatever be the nature of the attachment employed. The final pressure of the metal loop on the gut, or gut knot, being always downwards, a certain bias is imparted to the fly in the same direction, greater or less according as the angle of the metal eye is correctly or incorrectly achieved. The result of this bias is that the fly has of necessity a slight tendency to hang head down. This is one trifling 'blemish,' if I may call it so, which I rather think no care or nicety of adjustment in the matter of the angle of the turn-up eye can ever entirely

overcome. Another blemish—in this case not quite so trifling—is that the eye, being above the level of the hook shank, the gut, especially if very fine ‘drawn gut,’ does not form a line absolutely true with the centre of the fly, but slightly above it ; an imperfection which, as far as it goes, would have a tendency to impair the penetrating and holding power of the hook, and to make the stroke less certain. This principle is, as before observed, so well understood and established in the case of salmon flies, that the dresser, if he knows his business, invariably laps the gut or loop on the *under* side of the hook shank, with the intent to increase its killing capabilities. Why should not the same principle be pressed into the service of the fly fisher in the case of metal-looped hooks, for trout as well as for salmon flies ?



FIG. 21.—FLY TIED ON TURNED-DOWN EYED HOOK,
'JAM KNOT' ATTACHMENT.

Acting upon this idea, I have tried some experiments with the view of seeing how the theory would work in practice, with, I must say, the result of satisfying me that hooks with eyes turned down would be in all respects an improvement on the turned-up eyes. I find that with turned-down eyes, or more accurately loops, firstly, the fly floats perfectly horizontally, even with the finest gut, and after long immersion ; and, secondly, that the ‘lay’ of the gut is shifted from the line of the upper to that of the under side of the hook shank, thus securing the same advantage that has been described in the case of salmon flies. I find also that with the pattern of hooks I have elaborated, *and the loop turned down at something over half a right angle*, both the appearance and set of the fly are excellent (*vide cut*), and no amount of soaking or ‘whipping’

makes any difference in its perfect 'horizontalty.' In fact, the last contact or pressure of the metal loop against the gut being in an upward direction, it gives the gut precisely the support requisite at this point; it counteracts, that is, the natural tendency of a comparatively heavy hook suspended by soft wet gut to hang, however slightly, *head down*.

The only objection I can imagine being raised against the turned-down eye is that it diminishes, as it were, the 'gape' or width of the bend for hooking purposes. This argument is, however, at once negatived by a very simple consideration—viz. *the position of the legs (hackles) of the fly*. These 'protect,' so to speak, the hook eye, and head of the fly—whether tied on looped hooks or eyed hooks, or the ordinary plain hook—from any probable contact with the actual lips of the rising trout, so that the turn-up or turn-down of the loop cannot affect the actual hooking result in any way; and this theory I find to be most fully borne out in practice.

The method of attaching the gut is identical with that before described (fig. 20), the position of the fly in the protector being simply reversed—held, that is, with the point side of the hook bend up instead of down, whilst tying the knot.

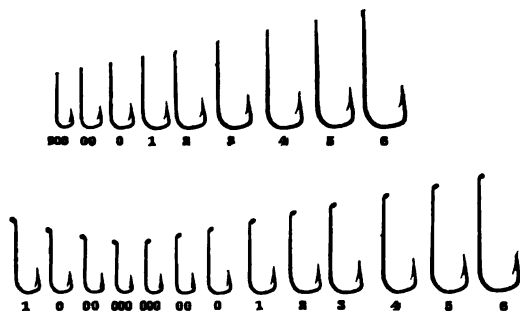


FIG. 22.—'PENNELL SNECK' PATTERNS OF TROUT HOOKS.

The patterns of the hooks referred to in the preceding observations, both with loops turned up and loops turned

down, are shown in the diagram—though I should repeat that engravings never really do justice to hooks, or convey more than a general idea of their characteristics.

The above patterns are also made 'plain'—i.e. without any loops or eyes—*vide* last cut, for tying on gut in the ordinary way. The bend was designed with primary reference to artificial flies, having a slight extra length of shank as compared to the size of the hook bend—a great improvement in the appearance and in the proportion between the flies and the hooks. They make a very attractive and dashing-looking fly; and if the principles of hook-making, already touched upon, are borne in mind, it will be readily understood that their killing qualities are equal to their artistic appearance. The point side of these hooks is of course straight—that is, there is no turning out, or twisting of any kind about them—all such twisted hooks being a direct violation of the plain rules of mechanics, and losing in real penetrating power what they gain (if gain it be?) in scratching and pricking.

I really fail to see what objection the most fastidious can raise to flies dressed on these hooks and fastened in this manner, whilst the advantages in many most important particulars are self-evident.

The result of knotting on the gut is, as is well known, to strengthen it at the point where it is most liable to fray and become weakened. It is also the point at which the parting arises at the flicking off of the fly, an occurrence unluckily too frequent. With the gut knotted on to the hook—whether the eye be turned or needle shaped—the result is the same; namely, that this point becomes the strongest instead of the weakest on the line, and that the flicking off of the fly is a matter of comparatively rare occurrence. Another great advantage is the saving of time in changing flies (by avoiding the soaking of the gut in the mouth beforehand, &c. &c.), and—more important than all—the avoidance of the unsightly strand of gut, possibly of different colour or different thickness to the rest of the casting line, at the very point where absolute uni-

formity and extreme perfection, both in taper and tint, are most desirable.

The following independent testimony lately published by a well-known sportsman and first-rate fly fisher, writing under the signature of 'Blue Upright,' more than bears out, in every particular, my high estimate of the advantages of the turned-down eyed trout hook, in favour of which—as my own 'bantling'—I might perhaps be supposed to be unduly biassed :

'Mr. Pennell's turned-down eyed trout hooks.'

'Having followed with great attention and interest the recent articles in your columns on the subject of the Turned-down Eyes for Trout Hooks, I had some flies dressed on Mr. Pennell's pattern, sizes 00, 0, 1, and as I have been using them for the last week, alternately with the ordinary flies lapped on to gut, so as to contrast them fairly, perhaps some of your readers may like to know the result of this practical trial, after reading a good deal which has been merely theorising.

'I may say, then, at once, that the result of the week's fishing, during which my worst day was four brace and my best nine brace, is, *on every point, favourable to the flies tied on turned-down eyed hooks.*

'I may summarise these points as follows :

'1. The flies never "flick" off.

'2. They can be changed—attached and detached—in less than half the time.

'3. They are stronger ; because whenever the gut gets at all frayed at the head it can be at once shifted (re-knotted on), whereas with flies lapped on to gut the weakening at the head commences very soon, especially after catching a few fish, and any change involves sacrificing the fly ; consequently the fly is, in many cases, used long after it has become weak. But beyond this there is, I think, an actual extra strength imparted by the form of knotting to the eyed hooks—Mr. Pennell's "jam knot"—as compared with the ordinary lapping. This is conclusively shown by the fact that whenever, owing to the flies getting fast in bushes, &c., a deliberate 'break' has become necessary, the fracture has never once occurred at the actual point of junction—or, in other words, at the knot ; nor have I met with an instance of the knot slipping.

'4. The eyed hooks appear to me to hook more fish in proportion to rises, and to lose fewer fish after being hooked. This, however, may be owing to the special bend of the hooks themselves rather than to the turned-down eye. But it would seem that the position of the gut on a plane rather below the level of the hook shank ought to increase its penetration.

'This is, however, bordering on the region of theory, into which I do not wish to enter.

'BLUE UPRIGHT.

'May 30, 1885.'

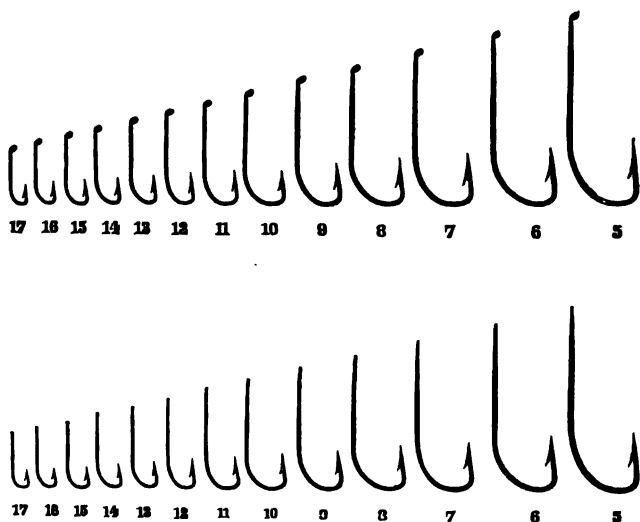


FIG. 23. — 'PENNELL-LIMERICK' BEND TROUT HOOKS.

In addition to the 'sneck bend' trout-hooks already described at page 29, the sizes of which do not run above Nos. 6 or 7, I have designed another pattern called the 'Pennell-Limerick' bend—both 'plain' and with turned-down eyes—suited to lake-trout and white-trout flies, as well as to the smallest midges and to the largest salmon flies.

These, as also the other patterns of my bends here described, both for salmon and trout flies, are manufactured by Messrs. Harrison & Bartleet, of Redditch, near Birmingham, under my instructions, and can be obtained also of Mr. Farlow, 191 Strand, London.

Amongst minor improvements in hook-making may be mentioned Mr. Court's 'enamelled rust-proof hooks,' which ought to prove a useful invention to the fly fisher. Hooks of all sizes have also lately been made of bronze colour—an intermediate stain between the japanned and the bright steel; and I must say I think a very excellent medium. This is the colour of Mr. Hall's turned-up eyed hooks, and I have adopted it also—produced (N.B.) by fire, not by any sort of lacquer—for my patterns, both of trout and salmon hooks. I cannot see why it should not be used for all hooks without exception. Mr. Court, of Redditch, is also, I believe, the inventor of hooks of various colours—red, green, blue, and yellow enamel [also rust proof] intended to match the flies. This is, indeed, 'to snatch a grace beyond the reach of art,' and as some of my readers may like to try these coloured hooks, it should be mentioned that they are manufactured by Messrs. Allcock & Co. of Redditch. Gilt hooks have, of course, long been known, and are credited with being an improvement for some particular classes of bait fishing, though I am not aware that I have ever known them used for dressing the artificial fly.

Next to the hook comes the Casting Line, involving matters connected with the selection, knotting, twisting, staining, &c. of gut; but I may perhaps first say a few words as to the manner of making gut, which I am enabled to do—though the facts are, I believe, somewhat in the nature of trade secrets—by the courtesy of Messrs. M. Carswell & Co. of Glasgow, and Murchia, Spain—the only manufacturers, as distinguished from importers of gut, in Great Britain.

It is supposed by many that 'silkworm gut' is made out of the gut of the silkworm. This is, however, a mistake, though

a very natural one. The substance out of which the gut is formed is quite separate and distinct from any of the organs of digestion, and consists of two thin capsules, or lobes, of a liquid substance, about one inch long by a thirty-second of an inch in diameter each, and lying longitudinally in the silkworm's body. The liquid substance contained in these capsules is, in fact, the silk before it has been spun by the silkworm. This 'silk substance' is taken from the worm at the period when it is preparing to begin spinning, which, as is well known, it does by coiling the silk round and round itself in what is known as a 'cocoon,' or a sort of hollow sarcophagus, in which it passes the chrysalis stage of its existence. Certain marks, known to silkworm cultivators, appear on the caterpillar when it is ready to begin spinning, so that such worms are readily distinguished from the rest. The selected worms are then thrown into tubs of vinegar and water, and left there for some hours—by this process both killing the caterpillars and congealing or partially solidifying the 'silk liquid.' The next process is to extract the lobes of silk from the worm by 'breaking it up,' as it is termed, and this having been effected the lobes are one by one caught lightly by the ends and pulled out as far as they will go. The third process is to throw the lobes thus extended—the gut, in fact—into heaps, where they are left to dry. When dried there is a yellow skin or fleshy substance over each strand, and this is cleaned or 'dissolved off' with some sort of alkali. The strands are now picked out according to their thickness and tied up into bundles of hundreds, and afterwards of thousands, when they are ready for the market. This is the whole process of gut manufacture, if it can be so called. The two little curls frequently noticed on a strand of gut come of their own accord, making their appearance naturally at the moment the strain is taken off after the stretching. Gut, it will thus be seen, is solidified silk.

The cleaning or 'dissolving off' of the outer yellow skin of gut, above described, is effected apparently by the use of some sort of alkali, which has a whitening or bleaching result that,

according to Mr. R. B. Marston, makes the gut semi-opaque. He observes :

Unstained gut is a most conspicuous object in the water, as its glossy surface reflects light so freely. If we could get unbleached gut—i.e. perfectly transparent—it would, perhaps, still be liable to this defect to some extent ; but ordinary unstained bleached gut is semi-opaque, as may be easily proved by placing it over black writing on white paper. Mr. S. Allcock informed me some time ago that there was no difficulty in getting gut like glass, but that the dealers would not buy it unless it was bleached—a process which impairs its strength—and he sent me some strands from which the thin yellow skin had merely been peeled off, instead of being removed by chemicals. This gut was as transparent as the purest glass. I should like to ask him if he cannot put some of this really transparent unbleached gut on the market, and also what prevents *undrawn* gut being manufactured as fine as drawn gut ?

But to return to my text—the selection of gut for fishing purpose :

The best gut is the longest and roundest, and the most transparent ; an observation which applies equally to salmon and trout gut—natural and drawn. For practical purposes these *desiderata* must be considered in conjunction with, if not, indeed, made subordinate to, the question of the fineness or strength of the gut in proportion to the fishing for which it is to be used. To get salmon gut which fulfils all the conditions pointed out is becoming yearly a matter of greater difficulty and, I might almost say, of favour. A perfect hank of salmon gut can only be obtained, as a rule, by picking the strands out of a number of other hanks which, of course, makes these considerably less valuable. Sixpence a strand—I have known a shilling a strand paid—for picked salmon gut is not at all an unusual or, indeed, unreasonable price, having regard to the difficulty of obtaining gut of really superior quality, and the all-important part it plays in a sport which, if not quite so expensive as deer stalking or grouse driving, is certainly becoming rapidly a luxury that only rich men can hope to enjoy. As

the rent of a salmon river, to say nothing of incidental expenses; may probably be reckoned at seldom less than three figures, it is really the soundest economy to begrudge no expense connected with the tackle, rod, &c., upon which the sport obtained for all this outlay depends. Moreover, as regards gut I believe that the best, and, consequently, the most expensive, is, in the long run, actually the most economical if proper care be taken of it. A thoroughly well-made casting line of carefully picked salmon gut will outlast three or four made of inferior strands, and during all its 'lifetime' will be a source of satisfaction. The breaking dead weight strain of a strand of the stoutest salmon gut, round, smooth, and perfect in every respect, ought not to be less than from somewhere between fifteen and eighteen pounds.

Why, in the case of salmon gut, as in that of all other commodities, the demand does not produce the supply, it is difficult to see. Caterpillars ought to be easily cultivated one would say. Think of the number of strands which might be produced by the inhabitants of a single mulberry tree !—

Millions of spinning worms
That in their green shops weave the smooth-haired silk.

I cannot but believe also, that by the application to gut-making of the same energy and intelligence which is being applied all over the world to other manufactures, a much longer and generally more perfect 'staple' might be produced. From a quarter to a half of the actual gut of the silkworm appears to be lost by the present process, as will be seen on examining the waste ends of a hank of any sort of gut that has not been picked and 'lengthed.'

For gut of extraordinary quality and strength, as much as from 5*l.* to 7*l.* per hundred strands—wholesale price—is now stated to be frequently paid in Marseilles—this gut being, it appears, principally exported to Constantinople. Some samples of the 1884 crop, tested by my friend Mr. R. B. Marston, broke at a dead strain of seventeen pounds. A writer under

the signature of 'Creel,' mentions that some thirty years ago there could be found in the market a superior class of salmon gut now said to be unprocurable owing to the total extinction of the silkworm that produced it. 'Since this time,' he says, 'we have more than once been informed that a new breed of silkworm has been raised and encouraged in the South of France, introduced from Japan, possessing all the features of the former fine and strong gut which from its absence has caused the lament of many a veteran salmon fisher.'

In the selection of gut, aim first, as Chitty says, in his 'Fly Fisher's Text-book,' 'at that which is perfectly round,' to which end the best assistance the eye can receive is from the thumb and forefinger, between which the gut should be rolled quickly; if it is not round but flat, the defect by this process will be at once discovered. Next to roundness, colourlessness and transparency are the two points of most importance; and last—though as some fishermen will perhaps suggest, not least—comes the question of length. On this point, I will not hazard a scale of measurement, lest I should bring about my ears a swarm of infuriated vendors of gut, which, were it mine, I should unhesitatingly commit to the flames, or to the keeping of the first small boy I found stickleback fishing. I may, however, quote the standard laid down by Chitty, above named, without getting myself into hot-water :

In length the part [of salmon gut] for use should run from sixteen to eighteen inches at least. The thicker trout gut should be of the diameter of ordinary sewing silk, whilst the thinner sort may be almost the very finest you can procure, provided it be 'round and sound,' and keeping in view all other requisites for strength. Ten to sixteen inches is the usual length of each strand. Salmon gut may be in substance as thick as you can find it, and you will possess a treasure if, in one hank, many lengths are as thick as a middling-sized pin or stout knitting needle.

He adds :

Each piece or length should be also to the teeth hard, like wire, colourless, and transparent as glass, which testifies strength, free

from unravelled fibres, that are attended with an inclination to split or peel; knotted roughness, which shows almost actual rottenness; the spaces between the knots, when pulled lengthways between the fingers, being soft and weak; or flashing lights, when seen in a slanting direction, indicating flatness, and consequent weakness. It should possess stiffness, too, in bending, and with this should be combined elasticity, so that after being doubled upon itself (in the shape of a loop, for instance), if it assumes anything like an angularity it will not do, for it surely possesses unequal degrees of strength, even if it be not absolutely rotten.

'Drawn gut,' as it is called, is simply gut that has been artificially scraped or fined down by being 'drawn' through a hole of a certain gauge or measure. For this purpose a steel plate is used having several holes or gauges diminishing gradually in size, and the 'face edges' of which are quite sharp. The gut is put through the holes in succession beginning at the largest, and ending with the smallest, when it has of course become of the desired fineness. Messrs. Carswell inform me that of late years they have introduced many great improvements into the manufacture of drawn gut by which almost all the transparent and durable qualities of the natural gut are preserved or reproduced. The appearance of the gut after undergoing this process is not, however, in my experience, so clean and transparent as the undoctored material, and though it looks beautifully fine—and, indeed, is so—it commonly frays and wears out very rapidly when exposed to moisture or friction of any sort. Drawn gut is, however, extensively used for many of the finer sorts of fishing, both with fly and bait. For my own part I prefer to pay almost *any price*, so to speak, for the natural gut whenever it can be obtained of the requisite fineness. This, however, is not always.

Knotting.—Many sorts of knots have been recommended at different times and are used by different fishermen and tackle-makers for knotting gut into casting lines. Decidedly the best, however, in my judgment, as well as the simplest, and one which is equally applicable to the finest and the strongest gut, is what is known as the single fisherman's knot (sometimes

called 'water knot'), varied in the case of salmon gut in the way that I will describe.

I think the method of tying this knot in the case of trout gut is so thoroughly well known as hardly to require an explanation ; still in view of these pages falling into the hands of an entire novice in angling matters, a diagram of the process is appended.

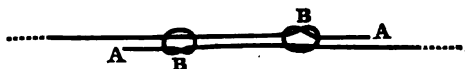


FIG. 1.—SINGLE FISHERMAN'S KNOT.

The two ends of gut, A, A, are laid parallel to each other being held in that position between the first finger and thumb of the left hand at the point and in the position in which they are to be joined. A half-hitch knot, B, B, is then made by the right hand with the end of each strand alternately round the strand of the other, and each separately drawn tight. In the case of trout lines and other casting lines for light fishing the two half-hitch knots are then drawn closely together and the ends cut off. If a drop-fly is used for trout or grayling fishing it is a very good plan to pass the end of the gut link of the fly between the two strands of the joining gut before drawing the knot close. This will make the drop-fly stand out at right angles to the main casting line, a result which it is very desirable to obtain. A single knot tied at the required distance in the link of the fly, and the gut nipped off close, will make it impossible for the fly to slip out of its place. This, as I say, makes a very neat knot for drop-flies—on the whole, perhaps, the neatest.

Another simple way, and one that will be found to answer every purpose when flies are being changed at the river-side, is simply to lay the drop-fly along the casting line, *fly upwards*, and make a double half-hitch knot with the end of the fly link round the central casting line. On this knot being pulled tight, and slipped down as far as the next knot of the casting line, it will be found to answer exceedingly well in practice, although

the point of junction is one which will always have to be carefully looked at from time to time, as the friction of the drop-fly knot is apt to fray away the link to which it is attached. For salmon fishing I never myself use a second fly, unless by any chance the river or lake I am fishing be also tenanted by white trout, and then, of course, the fly is a comparatively small one.

Nothing can well be more clumsy than the knots usually employed by the tackle-makers in joining the strands of a salmon casting line, and their inefficiency in the matter of strength is on a par with their unsightliness. One could hardly have a better illustration of the extreme slowness of tackle-makers to acquire any knowledge, even when it is thrust under their noses, as it were, than the fact that a knot immeasurably better on the score of strength, far neater in the matter of sightliness, tied with less trouble, and free from any conceivable drawback, should have been published nearly twenty years ago, and that the old-fashioned, comparatively worthless, knot, should still be that which they almost universally adopt ! In the 'Book of the Pike,' 1865, I gave diagrams and explanations of the knot referred to, which, though my own invention, I have ventured to characterise in the above eulogistic terms, for the reason that their accuracy or otherwise is capable of being put to a simple and conclusive proof. This knot has been since published in the 'Modern Practical Angler,' which has gone through four or five editions at least, and must, therefore, have passed under the eyes of the tackle-makers, a part of whose business it is to sell fishing books ; and yet, as I say, I cannot point to a single tackle-maker who has had the common sense to adopt my system of knot.

The principle of the knot is as follows : The gut having been thoroughly soaked beforehand in tepid water—which is, of course, a *sine quâ non* in all gut knottings—lay the two strand-side by side and proceed exactly in the same manner as that above described for tying the single fisherman's knot, with the exception of the final drawing together of the two separate half-hitches. Instead of drawing these two knots *together* and

lapping down the ends on the *outside*, as is the manner of the tackle-makers, draw the knots, *a a*, only to within about three-sixteenths or one-eighth of an inch of each other (as shown in the engraving, fig. 2) and lap between them with light waxed

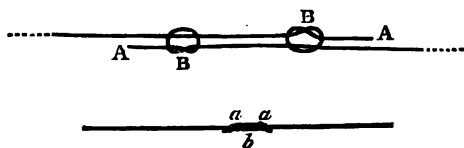


FIG. 2.—THE 'BUFFER KNOT' FOR SALMON GUT.

silk, *b*, or, which is the plan I generally adopt myself, with *very fine* thoroughly soaked silkworm gut. This lapping relieves the knot itself of half its duty, and on any sudden jerk, such as striking, acts as a sort of 'buffer' to receive and 'distribute,' as it were, the strain. Tied in the old-fashioned way I find that on applying a 'steady strain,' a salmon gut casting line breaks *almost invariably at the knot*. Tied in the manner I suggest it will break at any other point in preference, no matter how great the strain may be.

Major John P. Traherne, whose almost unequalled experience as a salmon fisher entitles his opinion to the utmost weight, has lately written as follows, on the subject of knots for salmon casting lines, to the pages of a sporting journal :

Not long ago I fondly imagined I had invented a plan for uniting the links of a casting line without knots, and was on my way to the 'Fishing Gazette' office to unfold my secret. My friend Mr. Cholmondeley-Pennell happened to accompany me on a different business, and on my letting him know what mine was turned round and said, 'My dear fellow, I am very sorry for you, but I brought that out years ago in the "Modern Practical Angler,"' and as we were passing Farlow's shop at the time he took me in and soon convinced me that he was right, and that his principle and mine are the same, although differently carried out. Therefore, although I can lay no claim to be the inventor of the 'buffer knot,' I can honestly say that I had never seen or heard of it before.

It is impossible to invent a better method of fastening gut together than that which makes the fastening the strongest instead of the weakest part of the casting line, and it is surprising to me that this method has not been adopted.—[The italics are mine.]

Though 'I say it that should not say it,' Major Traherne's frank testimony in favour of the absolute superiority of this knot over all others for gut salmon casting lines (or for gut traces in spinning) does not go one whit beyond the fact ; and if salmon fishers, buying and reading this book, acquire nothing in return but the knowledge of this one apparently trifling piece of information, their time and money would have been right well invested.

The difference between my knot and the variation of it described by Major Traherne is very trifling ; such as it is, however, I am of opinion that as regards neatness and simplicity of manipulation my original knot is distinctly preferable, and I have lately had letters from Major Traherne saying that he has come to the same conclusion.

In the case of casting lines for any fish smaller than four or five pounds weight no lapping of any sort is required *in any part of the casting line*. As lapping is ordinarily applied to such lines by tackle-makers no additional strength whatsoever is imparted, whilst the effect is to make that which is already an eyesore, though luckily a transparent one, into a still greater disfigurement, and one which, being opaque and at regular intervals of a foot or so, presents a most alarming appearance to the fish.

It has been pointed out that the single fisherman's knot—varied as I have described in the case of salmon lines—is all that is required for any description of gut knotting. I should, perhaps, however, make an exception to this statement in the case of drawn gut, and natural gut of unusual fineness. In these cases the extreme 'limpness' of the strands makes the single half-hitch very liable to slip, or draw out, if the ends are cut at all close, as they should be on the score of neatness. It is, therefore, better in such cases to make the knot with two

double, instead of two single, half-hitches ; the end, that is, with which each half-knot is tied is passed twice instead of once round the central link and through the loop in the manner shown in the engraving. The increase in the size of the knot with

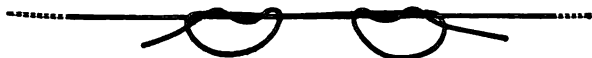


FIG. 3.

very fine gut is so small as not to be worth considering, whilst the increase of strength obtained is of decided importance.

In quitting the subject of gut knotting I will strongly recommend all anglers, whether fly or float fishers, to positively refuse to be supplied by the tackle-makers with any casting lines or traces in which the knots are lapped, except—in the case of the salmon lines—in the manner above described.

Twisting.—For the lower parts of casting lines of all kinds single gut is the only material that I ever think of employing, and I find it amply strong enough, when obtained of the best quality, for every practical purpose. As regards the upper part of the casting line, however—say two or three feet—it will be found convenient, especially in the case of salmon lines, to interpose some thicker medium between the reel line and the single gut bottom, and, for this purpose, gut, twisted in the way I will describe, is in every respect the best. The ordinary twisted gut, as sold in the tackle shops—that is, in lengths of about one foot each, and joined with a huge unsightly knot—were always such an eyesore to me that I was induced to take some little trouble in providing myself with a more workman-like substitute.

My plan is as follows :

I take two tapered casting lines of the thickness and length required and knot them together at the two thickest ends. I then bend the lines, a few inches away from this junction, over a hook fixed into the table, window sash, or what not, but so that when the two ends of the double cast thus formed are laid

parallel with each other the knots of one should fall on a different spot to the knots of the other. This is to prevent any undue thickening or awkwardness of twisting at any particular point. The two lines, or rather what has now become one line, being adjusted on the hook or peg in the manner described, proceed to twist them together with the finger and thumb of the right hand—the left hand being employed alternately in holding and securing the twist up to the point reached, and in keeping clear and well separated from each other, at the angle of something like 45° , the two separate halves of the link, which will exhibit a decided inclination to make a twist on their own account. The line should be well moistened before being twisted, and if done in the manner I have described and with a certain amount of intelligence, that any man who is accustomed to exercise his fingers in tackle dressing ought to find it easy to acquire, the result will be an evenly twisted and well-tapered gut top, which, unless prematurely carried away, should last for 'generations.'

This twisted line, being interposed between the running line and the single gut bottom, materially increases, as I say, the facility for casting in the case of salmon lines.

Plaited gut lines are sold at the tackle shops which are free from some of the defects I have pointed out in regard to their casting lines of twisted gut, but they are not so strong as a line twisted in the way I have described, and, except when very thick indeed, are scarcely reliable for heavy work.

Staining.—All sorts of stains are recorded by different authors and adopted by different fishermen according to individual taste and fancy. I used personally to fancy what is known as the red water stain for rivers where the water took a darkish or porter-coloured tint after a fresh, and for 'white' waters a light bluish or cloud colour. I am by no means clear, however, that in the case of the fly fisher there is any sufficient warrant for this nicety of refinement, if, indeed, it be a refinement at all in the proper sense of the word. When we see a porter-coloured water we forget that we are looking down

from above, whilst the fish we wish to catch is, in all probability, looking up from below, and that our line being 'flotant' is but a few inches below the surface of the water. The result is that when he comes up to take the fly the stratum of water interposed between the gut and the sky is really, when viewed by the human eye at any rate, almost colourless. It is the depth of water which produces the depth of colour. The same thing again applies to the clear streams which after a flood become merely slightly thickened with mud and never take the red or bog-water stain under any circumstances.

In order as far as might be to satisfy my own mind as to what practically was the best stain, I arranged an experiment in which the actual conditions of the floating line were as nearly as possible reproduced—substituting my own eye for that of the fish. I got a glass tank with a glass bottom, and I found that with about three inches of water in it the difference between water stained with tea or coffee to about the same extent as the red water of a river, or slightly clouded to represent the waters of a chalk stream, was, for practical purposes, *nil*, and I came to the conclusion, after trying various experiments on these lines, that the stain which was most like the colour of the sky was in every case the least visible; also, that the very lightest stain was better than a dark one, and that in the case of perfectly sound clear gut no stain at all seemed practically to be required, as the negative colour, or rather approximate colourlessness, of the gut seemed to harmonise, on the whole, very well with most kinds of sky tint.

When, however, the gut is not entirely round and clear, or is at all 'stringy,' it is very apt to have a sort of gloss, or, when the sun is shining upon it, glittering effect in the water, which is highly undesirable. In such a case some neutral-tinted stain, which will have the effect of removing the gloss in question, would probably be very advantageous. I know no better stain for this purpose, or for a sort of greyish green that it produces, than the following, for which I was originally indebted to Mr. W. C. Stewart, the accomplished fisherman

and well-known author of a charming book on 'Fly Fishing and Worm Fishing for Trout in the Clear Streams of Scotland.'

The first step in the process is to impart to the gut a lightish tint of the common 'red-water stain.' For this purpose take a teacupful of black tea, and boil it with a quart of water for twenty minutes : afterwards strain it, and boil down the liquor till it comes to a pint : keeping the gut steeped in the mixture until it has acquired the necessary tint [Mr. Stewart says 'put the gut in whilst *boiling* and let it remain till cold']. This process will sometimes take only half an hour or even less, and sometimes several hours, according to the strength and staining power of the tea : when sufficiently stained, rinse the gut well in cold water. When dry, take a handful of logwood chips (obtainable at most druggists'), and boil them in a quart of water till the latter is reduced to about a pint. Then take it off the fire, and put into it a small piece of copperas (sulphate of copper) about the size of a hazel nut, powdered, stir the mixture, and when the copperas is dissolved, which it will be in a few minutes, dip the gut into the mixture until it has got the dirty greyish-green tinge described. Very often a few instants' immersion will be sufficient, and in order to ascertain the exact amount of the stain, as well as to avoid overstaining, it is best always to keep a basin of water close at hand to rinse the gut in, the moment it is taken out of the dye.

For the common 'red-water stain' tea leaves used as above described will answer every purpose ; or coffee that has been previously charred in a frying pan and ground, will answer instead of tea.

To produce a slate stain mix boiling water and ink, and soak the gut in it—rinsing it thoroughly when it has attained the desired colour. This, indeed, is a precaution that should never be omitted in staining gut, which is otherwise apt to lose its transparency. When too dark a stain has been given it may readily be reduced in intensity by soaking the gut in clean boiling water. Another ink stain that sounds as if it ought to be good, is given on the authority of Mr. R. B. Marston :

Anglers should always, when going away fishing, provide themselves with a small bottle of Stephens' blue black ink. You can easily get any tint you like, from a pale blue to almost black, by soaking the gut in this ink for a few minutes, or for several, according to the depth of stain you want. Rinse the gut in clean water when you take it out of the ink, and then there is no fear that the strength of the gut will be affected, as is most certainly the case with many of the dyes used.

A gentleman I once met at Loch Leven told me that he had a friend, a first-rate fisherman, who never used to stain gut ; but effectually took off the glitter by simply drawing it once through a piece of fine emery paper.

For dressing flies, where gut is used in the bodies, Judson's aniline dyes, kept by most chemists, will produce any sort of stain required. The directions are given on the bottles, but I recommend the use of only one-half the proportion of water. Some of the stains produced by the aniline dyes, however, destroy the texture of the gut.

Hair, which I cannot recommend for any sort of fly fishing, and which when used should be taken from the tail of a stallion, is seldom stained, being generally preferred of the natural brownish tint. If, however, it is required to stain it for the purpose of fly tying or otherwise, the animal greasiness must be first removed by slightly boiling the hair in a 'mordant' obtained from an ounce of alum dissolved in a pint of water. This is also a good preparatory mordant for feathers before they are dyed.

Passing from the gut to the reel, or running line, I find so wide a field open before me that I despair of being able to do justice to the numberless different descriptions of lines, dressed and undressed, silk, hemp, hair, and what not, which compete for the fly fisher's favour.

When I served my apprenticeship to the craft almost everybody used a line composed of a mixture of silk and hair, and this has still some votaries left, amongst whom, however, I am

decidedly not one. It had, in fact, only one good quality, lightness ; perhaps I should say half a good quality, because the lightness which is of advantage in the water is a great disadvantage in casting against the wind. For the rest, this silk-and-hair line possesses pretty nearly every drawback that can well be combined. The moment it is not tightly stretched, in other words, that it has a chance of kinking, or crinkling up, it promptly does so ; the protuberant points of hair impart a disinclination, almost amounting sometimes to a positive refusal, to allow itself to pass through the rod rings, whilst, even under the most careful treatment, it gets rotten, or so much weakened as to be untrustworthy, after the shortest term of service. So much for 'silk and hair.'

Hair by itself may be dismissed in a very few words. As contrasted with the silk mixture, it possesses its virtues in a greater and its faults in a minor degree. It is still more floatant in the water, where also it is much less visible, and it never gets rotten. But as a set-off the difficulty of casting against the wind and the friction in the rod rings are, of course, exaggerated. On the whole, although I have used reel lines entirely made of brown horsehair for trout fishing in calm and bright weather with considerable satisfaction, I decidedly prefer a dressed — i.e. waterproofed — line, whether silk or hemp, which is suitable for windy as well as calm weather, and which with proper care will last quite long enough for all practical purposes.

For salmon fishing, of course, lines made of hair, or of silk and hair, would be put out of court on one ground alone, namely, a want of sufficient strength.

With regard to the question of hemp or silk, I must say that when the 'Manchester Twine Cotton Spinning Company' first started they sent me some lines, both dressed and undressed, which were exceedingly perfect, and which I believe, after fourteen years' occasional service, to be still as strong as ever—in fact, so strong that on trying one of them just now with both hands a friend of mine failed to break it. This line, however, is what is termed 'cable-laid'—twisted, that is, in the

same manner as a ship's cable—the principle of which is that whilst the cable itself is twisted from right to left, the separate ropes of which it is composed are twisted from left to right. The result of this is that the two twists counteract each other in their mutual inclination to kink, and when wetted, the cable, instead of swelling, hardens and contracts. Of the plaited hemp lines issued by the same Company I have nothing good to say, neither did any of the dressings of them that I have seen properly effect their object, and if they did so temporarily, my experience is that they would not stand.

In the case of the particular line to which I refer, no semblance of dressing of any sort now remains, or did remain after the first few months, or, perhaps, weeks, of real 'service in the field,' on any part of the line which had come into actual use. The strength, however, was and is, I think, bulk for bulk, unequalled by any lines that I have met with made of silk. The latter, however, possess the great advantage of taking the dressing, or waterproofing, perfectly, and admitting afterwards of a smoothness and polish which facilitate very greatly the running out and the reeling in of the line.

These dressed silk lines also, if not absolutely so strong as those made of hemp aforesaid (which I would not assert), can be made quite strong enough for all practical purposes. I say advisedly 'can be made,' because I have found the most unexpected differences in the strength of different so-called dressed lines of the same thickness, and where they have been said to be of the same manufacture. The best rough and ready method of testing is to take a foot or two of the line between the hands and ascertain, by breaking or trying to break it, what is its actual strength.

It appears, then, that on a computation of advantages and disadvantages our support should be given to dressed silk lines for fly fishing; and as these are made of every thickness, from that of an ordinary piece of stout sewing cotton almost to that of a bell rope, everyone can, without difficulty, suit his particular objects and tastes.

Then comes the question : Shall the dressed silk line be 'level'—that is, of equal substance throughout—or 'tapered,' which means in ordinary parlance, getting finer towards the end at which the casting line is to be attached ? The latter is sometimes what is called 'double tapered,' that is, the line is tapered at both ends—or it may be only a 'single taper,' when, of course, the taper is made at one end only. As between level and tapered lines, each has its advantages and its disadvantages, but, on the whole, I think nine fly fishers out of ten prefer, in practice, a line more or less tapered towards the casting end.

So far as the actual casting is concerned, apart from 'fine fishing,' these details are of little importance on quiet days, but in rough stormy weather, when the wind is blowing half a gale, perhaps right in the fly fisher's teeth, the case is radically altered, and the man whose line is properly balanced and heavy enough to cut through the air like a bit of wire will be able to go on casting with comparative efficiency, while his neighbour, less perfectly equipped, will find his flies blown back in his face every other cast.

I have had some lines manufactured with the design of obtaining still greater casting power under such circumstances, and I think the experiment has been sufficiently successful to justify me in recommending fly fishers, and salmon fishers especially, to give it a trial. The principle is to 'swell,' or double taper, *each end* of the casting line at a point so near the end that the whole of the 'swell' or double taper *shall usually be between the point of the rod and the fly when a cast is being made*. This sort of swelled taper, or whip-shaped line, is, of course, made at both ends of the reel line, so that when one end gets worn out the line can be reversed and the other used. In practical experiments carried out with this and other lines, with different rods, both trout and salmon, and under different circumstances, I found that there was no appreciable difference in calm weather, but that when casting across, or, still more, against, a sharp wind, the 'swelled' line went out decidedly straighter and more easily.

I do not know if I am entitled to consider myself as the author of this invention. The idea suggested itself to me when chatting on the subject of reel lines with an excellent practical salmon fisher, whom I once met in Scotland. He made use of the word 'swelled line,' and I thought he meant such a line as that I have now been describing, but I rather think, from the remainder of our conversation, that it was the ordinary double-tapered line—a long line, that is, swelled in the middle—which he had in his mind, and described himself as using. At any rate I could not find that the London tackle-makers had ever heard of such a principle or had had any such lines in stock. Mr. Farlow, who made my lines, is, I believe, prepared to execute orders for similar ones.

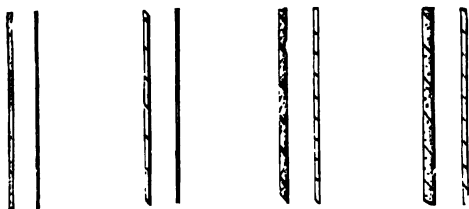
The importance to the salmon fisher of a line which will cut its way through a fierce March squall has been so well recognised that in order to give greater 'cutting' power line-makers have even gone to the extent of manufacturing reel lines with wire centres. They do not answer well, however, in practice, and my friend Mr. Senior informed me that some he had tried 'went to pieces,' almost immediately.

The colour of the casting line is a matter rather of individual fancy than probably any great moment, the more so as the effects of different colours as presented to the eye of the fish between oneself and the sky is very imperfectly understood.

I may perhaps here mention a little 'dodge' which I have found convenient in winding a new reel line on to the reel—winding it, I mean, off the hard, neat 'coil' in which it is received from the manufacturer. After cutting the 'ligatures,' I insert inside in the coil of line a stiff newspaper—rolled up—which being elastic stretches and keeps the coil properly expanded; through the centre of the newspaper winder I pass a rod joint or smooth walking-stick. This, of course, allows the line and newspaper winder to revolve freely. The two ends of the stick being now held by somebody's two hands, the line will 'reel off' with complete ease and regularity—as well, in fact, as from the tackle-maker's own winder.

This naturally applies to any kind of line, dressed or undressed.

The art of dressing a line, whether for trolling or fly fishing, is in itself a speciality, and one which few amateurs will probably find it worth taking the trouble to practise for themselves, but in case they should desire to become their own line



BRAIDED SILK LINES DRESSED.

dressers, they are advised to try the receipt given by Major Traherne, as the result of his experience on the best mode of dressing silk lines for fly fishing, in his article on fishing for salmon with the fly.

Reels.—The Fisheries Exhibition of 1883 was prolific in new reels, many of which it must be confessed were not only highly ingenious as inventions, but really excellent in their adaptation to different sorts of fishing.

Of these new reels I propose briefly to describe the six principal, with their uses. Of these four have been patented, and I will give their inventors preference, merely observing that, with the exception of the reel exhibited by Messrs. Watson, the whole of the reels referred to are applicable rather to salmon or trolling lines and other heavy fishing than to *single-handed trout rods*. As Mr. Malloch has two patents I will begin with his

Malloch's 'Sun and Planet' reel—a powerful reel, of the ordinary shape in regard to the make and external appearance; the right-hand plate being of metal and the opposite side of

ebonite. The reel itself is very handsome and comparatively light, leaving absolutely nothing to be desired in the way of finish. The point, however, in which the reel differs from all others (except Mr. Anderson's reel) is that the revolving plate and handle remain *stationary* when a fish is taking out line, and, consequently, the fisherman's hand is never required to be removed from the handle, as is the case with other reels when playing a fish. Nor is the action of the reel liable to be stopped by the coming in contact of the handle with any part of the dress of the fisherman or other external obstruction. This would, no doubt, prove a great advantage in all lake trolling, and other fishing when the rod and reel are left resting on the bottom of the boat, as any hitch in the 'paying out' of the line under these circumstances is apt to end disastrously. Amongst the other merits claimed for this reel by its inventor are the following :

By a slight pressure of the finger and thumb on the handle while the line is being taken out, the run of the fish may be checked as much or as little as the angler desires. The reel cannot 'overrun.' When the line slackens it may be wound up in half the time required for the ordinary reel—a great advantage in trolling with long lines, or when the fish runs towards the angler.

I do not see, however, how the line can be wound up 'in half the time,' inasmuch as in my reel the 'multiplication' appears to be only an increase of one turn extra of the axle for every four of the handle. This is probably, however, quite as much as is desirable, having regard to the loss of power involved in multiplying reels when winding-in heavy fish. The weight of a reel, three inches and three-quarters in diameter, is one pound one ounce.

Mr. Malloch's second patent 'casting reel'—of which a diagram (fig. 1) is attached, in the two different positions in which the reel is used—is not intended to be applicable in any special way to fly fishing. It might, however, be used in some cases advantageously for worm fishing and prawn fishing for salmon, as well as any sort of trolling in which casting from

the hand [or, as it would be in this case, from the reel] is practised. The principle is that when casting, the reel is twisted



FIG. 1.
MALLOCH'S CASTING REEL.

by the hand at right angles to the rod, in the position shown in the right-hand figure, when, in consequence of the convex shape of the right-hand plate, the line runs off it without any revolution of the reel, and with great freedom—with such freedom, in fact, that I believe the patentee won a prize at the last anglers' tournament in London by making a cast with it of seventy odd yards. In order to do this, however, the line used must be of the finest possible description,

whether dressed or undressed ; the undressed pure silk Nottingham line being the best.

When it is intended to wind-in the line or fish, the reel is turned with the right hand back again into the position shown in the left-hand figure, when it acts like any other check reel. Its particular applicability, however, is to what is known as the Nottingham style of fishing, of which a more detailed account will be found under that head in Volume II. The weight of this reel—one pound five ounces for a four-inch diameter—is so considerable as to be to that extent a drawback. There is also another imperfection incidental to the principle of its action ; viz. that for every coil that is thrown off, when it is in the position shown in the right-hand cut—that is, without the axis of the reel revolving—a twist is given to the line cast : in other words, in a cast, say, of forty yards, there would be, allowing six inches of line to each coil, two hundred and forty abnormal 'twists' imparted to the line between the reel and the bait !

Another ingenious invention, intended to be used both for 'Nottingham' and other kinds of fishing, is Mr. Slater's patent 'Perfect Combination Reel,' as he has called it (fig. 2), made

entirely out of ebonised mahogany, and, therefore, very light ; a four inches and a half reel weighing only ten ounces. By shifting the small nut on the left-hand side plate, this reel can be made either 'plain' or 'check,' the former being intended to favour the casting of the bait 'from the reel' in the Nottingham style, already alluded to. In construction the reel is also approximate to the Nottingham reel, consisting of a barrel, or winder, freely revolving on a steel pivot or centre pin, which is fast to the frame. Attached to the non-revolving or fixed (left-hand) plate is a brass frame or 'cage,' supporting the horizontal bars, between which, as in ordinary reels, the line passes. This frame or cage is 'recessed' into a groove in the revolving



FIG. 2.—SLATER'S PERFECT COMBINATION REEL.

barrel. The left-hand, or back plate, and the frame or cage, therefore, remain stationary, while the barrel or winder revolves independently of them. A catch is provided in the front or revolving side plate, or barrel, by which the latter can be readily taken off the pivot for oiling and cleaning. It is in this separated condition that the two portions of the reel are shown in the engraving. The 'Slater reel' is, in fact, a Nottingham reel with bars, and it is principally in relation to the Nottingham style that its advantages—except in its extreme lightness—are apparent. The revolution of the side plate and axis is so arranged as to present the same perfect freedom of movement claimed for the old-fashioned open Nottingham reel, whilst at the same time obviating the inconvenience of the line constantly hitch-

ing round the back and other parts of the winch. The object of the revolution of the whole of the right-hand side plate or barrel—outside rim included—is, of course, to enable the check to be placed upon the running-out of the reel by the caster's hand, without which means of regulating the length of the throw Nottingham fishing would be out of the question in practice. One great merit of this reel is undoubtedly its extreme lightness.

Mr. Anderson, of Princes Street, Edinburgh, and Dunkeld, exhibited a very ingenious reel—the 'Excelsior'—the principle of which is in many respects similar to that of Mr. Malloch's patent 'Sun and Planet' reel, although the mechanism by which the result is obtained is somewhat different. The principle is that when the line is drawn out by a fish or by the hand the side plate does not revolve—nothing revolves, in fact, except the 'winder' and the two internal plates—the moment, however, that the handle is grasped firmly by the fingers it operates in every respect like an ordinary check reel. The specimen that I have is a very prettily finished bronzed reel suited for trolling or lake fishing with a double-handed rod. The diameter of this reel is three inches and, *with about sixty yards of medium-sized dressed silk line*, it weighs thirteen ounces. This size, however, is not large enough for salmon fishing.

An ingenious invention for getting rid of the revolving side plate is shown in the engraving (fig. 3), which is the facsimile of a reel that I have used with satisfaction for fly fishing for trout and other light work where weight is a matter of primary importance. The object of countersinking, so to speak, the handle of this reel is to prevent its projecting, as in the old-fashioned plateless crank-handled reels; which was a source of constant annoyance owing to the line getting caught round it. The handle was also very liable to be damaged or bent on the smallest provocation. The advantage which the old-fashioned reel possessed was its lightness. The same advantage may be claimed for Messrs. Watson's reel, whilst the drawbacks of the old system are obviated. This reel, which is supposed to be

the ordinary 'check,' might be in some respects improved upon in matter of finish ; the rim also should be thickened so as to prevent its being indented on meeting with falls or rough usage. A two and a quarter inch reel of this pattern, including thirty to forty yards of the very finest dressed silk line [not thicker than thread] is six ounces. The reel would hold probably twice as much. It is better suited for light than for heavy work, or, in other words, for trout or float fishing, than for salmon or pike fishing.



FIG. 3.—WATSON'S REEL.

Last, 'but not least,' we have Mr. Farlow's 'patent lever,' which up to the present time has only been applied to salmon and trolling reels. Diagrams of the reel and the internal arrangement of the patent mechanism, reduced to one-half the actual size, are annexed.

The object of the patent is, by an adjustable screw, marked A in the engraving, to enable the strength of the 'check' to be regulated exactly as the fisherman may wish, or at pleasure removed altogether. This *desideratum*, the practical con-

venience of which will be readily recognised, is entirely fulfilled in Mr. Farlow's handsome and substantial reel. The

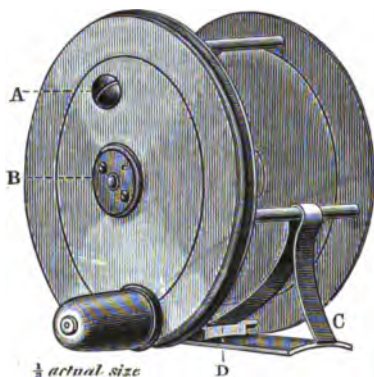


FIG. 4.—FARLOW'S LEVER REEL.

plate, marked B (fig. 4), covers the end of the axis and enables the machinery to be lubricated. The latter is of the simplest

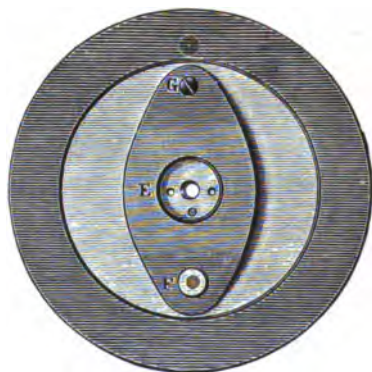


FIG. 5.—FARLOW'S LEVER REEL—MECHANISM REGULATING 'CHECK.'

description. E G F (fig. 5) is a piece of convex springy steel, interposed between the left-hand exterior and interior side

plates of the reel. It is fixed by a screw to the outer plate at c. When the screw, r (fig. 5)—corresponding to A in fig. 4—is tightened, or screwed up, the effect is to press this steel plate against the interior or revolving plate of the reel at E, the tension, or pressure, being thus decreased or increased at pleasure.

Amongst these admirable inventions both the salmon and trout fisher will have, I think, no difficulty in selecting a reel entirely suited to his taste, observing that the question of weight is one deserving of great consideration, especially by fly fishers who are not burdened with superfluous muscular development of the back and arms. If the lower portion of the reel line, which is not used in casting, and which undergoes but comparatively little wear and tear, is made to consist of either moderately fine untapered dressed silk line, or still better, of a line of hemp such as I have already described, the weight of the salmon reel may be considerably reduced without any loss whatever either of efficiency or 'compass.'

Allowing thirty yards of stout tapered line—either of the ordinary taper, or of the swelled or double taper which I suggest—for casting purposes, sixty or seventy yards of hemp line strong enough to hold anything that swims can be got comfortably upon a three and three-quarter or four-inch reel, and this length (ninety yards) will usually be found sufficient for all practical purposes.¹ The two lines should, of course, be very carefully and neatly lapped together with fine waxed silk at the place of junction, so as to obviate any danger of the line getting stuck in the rings at that point when running out with a fish. If small stiff steel rings, such as I use myself and advocate for *every description of rod*,² are adopted, the chance, whatever it may be, of any 'hitch' at the critical moment will be reduced to a minimum.

¹ I like 130 to 150 yards on the reel for salmon fishing—75 yards of each sort of line. In big rivers I have had a good deal of the second half run out by a heavy fish. The having two kinds of line indicates, when the second begins running, at what distance the fish is from you, which in very broken water is sometimes difficult to ascertain.—ED.

² I cordially agree in the advantage of standing rings.—ED.

A best four and a quarter inch diameter London made, stained brass reel, with eighty or a hundred yards of stout dressed salmon line—or, in fact, as much as it will hold—weighs two pounds one ounce. This is the sort of reel which usually finds favour with salmon fishers, but to my mind it is unnecessarily large and weighty.

The weight of the reel, however, should be always adapted to the length and 'balance' of the rod. For a ladies' rod, in cases where the price of a reel is of no consequence, wonderfully light reels about half the ordinary weight and made entirely of aluminium can be obtained. I have seen one, two and a half inches in diameter, in the shop of Mr. Little, in the Haymarket, that would have made a charming reel for a light trout rod, and the weight of which was *under* three ounces. The price of this reel was four guineas. Mr. Little also showed me a beautiful light salmon or grilse reel of his, made of ebonite and German silver, and weighing twelve ounces.

I once had a set of three reels, which I must call 'ideal,' presented to me by an amateur in reel-making. The material was gun-metal, and the lightness and perfection of mechanical 'finish' left absolutely nothing to be desired. Unfortunately I was not the only one to appreciate their beauties, and whilst paying a round of official visits to the fisheries on the West Coast of Ireland, some enthusiastic Patlander relieved me of further trouble as regards their custody. I did not find out the theft until too late to retrieve the situation.

I remember well, however, that one cause of the extreme lightness of these gun-metal reels was that there was no extra thickening of the side of the reel to contain the 'check' machinery. By dint of skilful workmanship this machinery—which worked admirably—was fitted into the side plate, without any noticeable increase of bulk.

To return : in the observations which I have offered on the subject of reels generally I have assumed that all practical fishermen will use a reel which is either always, or can be

made when desired into a 'check.' The old-fashioned 'plain reel,' as it is called, possessed certainly the merit of being plain and, to a certain extent, simple, in the sense of not being likely to get out of order ; and there its merits end. When there is no check to interfere with the rapid rotatory motion of the wheel set going by a heavy fish, there is nothing in the mechanism to prevent the line what is called 'overrunning,' the result of which is a constant danger of a sudden 'hitch,' or stoppage, occurring at the critical moment.

Multiplying reels, at any rate of the ordinary type, are, in my opinion, equally objectionable upon another ground, namely, that, when it is desired to 'wind-in' a fish, the old mechanical axiom of 'that which is gained in speed is lost in power' is apt to come into operation with disastrous results. No man can fairly wind-in a heavy fish with such a reel, and now that reels with narrow and deep, instead of broad and shallow, grooves are almost universally manufactured, there is no practical advantage gained by the rapidity of action in this respect.

In all the reels, however, even of the newest patterns, there are two slight imperfections which somewhat mar the regular winding-in of the line. The first is that the axle is, I may say universally, made with a small projecting shoulder, which though pretty to the eye as a 'finish,' causes the coils after the first few turns to wind irregularly. The same result is produced by the knot necessary to be tied in the line to fasten it to the reel, and which usually sticks out right in the middle. To remedy these two slight defects, which were pointed out to me by a practical amateur reel-maker, whose name I do not know, all that is necessary is to abolish the 'shoulder projection' referred to, and to bore one side of the 'line hole' in the axle sufficiently capacious to countersink the knot.

A third imperfection, I may here remark, is the unprotected circumference or posterior curve of the ordinary reels. This leads to the frequent catching or hitching of the line where by

any chance it happens to be hanging slightly loose below the bottom ring, a position which I find it pretty constantly occupies in practice. To obviate this inconvenience I have my reels fitted with a spring, clasped over the hindermost bar of the reel in the manner shown in the diagram (fig. 4, p. 58). This spring, c, is let into, and screwed down upon the base of the foot plate at the point marked d. I can strongly recommend this addition as a great practical convenience. It can, of course, be applied to any ordinary form of reel already in use—that is, it is applicable to old as well as new reels.

The reel and line having been selected, the next thing is the mode of attaching it to the rod.

For this purpose many plans, more or less ingenious, have at different times been adopted. Some reels are—or used to be—fitted with a circular clasp underneath, which, being tightened by a screw, is expected to hold the reel in its place, and with an old-fashioned shaped straight butt will in certain cases fulfil the expectation. With butts such as are now the fashion, however, sloping rapidly away from the handle, these fastenings, which were at no time very popular, have naturally become obsolete. Then there is another class of fastenings, such as that shown in the engraving (fig. 1), in which the reel fixture is adjusted by a catch of some sort. These ‘fastenings to measure,’ however, all possess the disadvantage of being inapplicable to any reels except those specially constructed to fit them. The ordinary double banded reel fastening was better decidedly than any of these, inasmuch as, unless the fault of the reel was its being too big in the foot plate, they could, by means of a strip of leather or paper underneath, be made at a pinch do duty with a reel of any dimensions.

I have no hesitation in saying, however, that all the above descriptions of reel fastening are now put completely, and I believe, permanently, ‘out of Court’ by one of the cleverest inventions of all those which were submitted to the jurors of the late Fisheries Exhibition. This is a plan invented by Messrs.

Hardy Brothers, of Alnwick. It is simple, inexpensive, absolutely secure, and capable of being adapted to every kind of

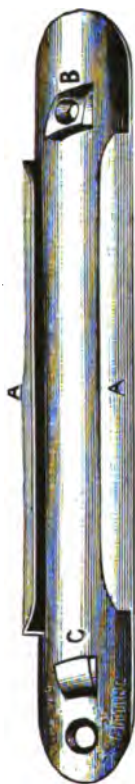


FIG. 1.

FIG. 2.—HARDY'S REGISTERED
WEDGE REEL FASTENING.

rod. Moreover—short of applying a heavy salmon reel to a light trout rod—this fastening (fig. 2) adapts itself to reels

of all shapes and sizes. The hinder end of the foot plate of the reel is pushed under a fixed band or clasp having a gradually widening orifice upwards, and of course a narrowing one downwards—in other words, it is wedged in—penetrating deeply or only a little way according to its size and thickness, but in any case being held or jammed perfectly fast in its place. The upper band, or clasp, is then slid down over the upper end of the reel foot plate, which thus becomes immovably fixed. A diagram of this reel fastening is appended, in the form in which it was originally exhibited. At my suggestion, however, the patentees have now arranged the bottom clasp so as to completely embrace the circumference of the butt, thus both adding to its completeness in the matter of strength, and at the same time improving its general sightliness.

I am not, as a rule, a believer in 'finality' in regard to mechanical inventions, but I must say that as the above fastening fulfils every requirement which the most *exigeant* can demand, I am really inclined to think that for once, in this particular at any rate, fishing tackle has really arrived at perfection.

With regard to fly rods I shall say but little. *Quot homines tot sententia.* Some fly fishers like hickory, others prefer greenheart, or lancewood. Some like a rod made all of one wood, others give the preference to a rod with the butt of one sort of wood and the top joints of another. One good fly fisher, at least, I have known who never used anything but a bamboo rod, made 'swishy' as to the middle joints, and a great many of the modern school, especially those with whom price is not a matter of importance, have given in their adhesion to the spliced-cane rods, which are supposed to owe their origin to our enterprising cousins on the other side of the 'Herring Pond.'

In the 'form' of the rod again, as in regard to the wood of which it may be constructed, it is rare to find two fishermen of the same opinion. Many still hold to the old-fashioned straight-butted rod, which tapered away with almost mathemati-

cal precision from the reel to the point, alleging, amongst other advantages claimed, that with this shaped rod a spare top can always be carried in case of accident without the inconvenience of a separate top case. Of late years, however, many practical fly fishers—indeed, I think I may say the majority—favour some modification or other of the form of the rod which owed its birth, or, at any rate, its christening, to the *habitués* of Castle Connell—preferring the swishy play obtained by fining or tapering away the butt rapidly from above the reel. . . .

On all these subjects, were I to go into them in detail, I might easily double the length of this chapter, without carrying conviction, or probably amusement, to anybody but myself. I, therefore, refrain from doing more than touching thus lightly on the mere superficial aspect of the question, leaving every man to remain, as, indeed, he ought to be, and would be for anything I could write to the contrary, his own counsel, judge, and jury.

With regard, however, to the now fashionable split-cane rods, a few words on the method of their construction, and on their two principal varieties, may possibly not be uninteresting to those who are not already initiated into the mysteries of this interesting branch of rod-making.

In the 'Art of Fly-Making,' published by Mr. Blacker about thirty years ago, second edition, occurs, I believe, the first notice of split cane rods. 'The beautiful rent and glued-up bamboo-cane fly rods,' Mr. Blacker says, 'which I turn out to the greatest perfection, are very valuable, as they are both light and powerful, and throw the line with great facility. The cane for these rods must be of the very best description, or they will not last any time. They will last for years, however, if really well made, and,' he very properly adds, 'taken care of.' The wood employed in their manufacture is the 'male bamboo,' procured from India; great care and experience being required in selecting only such canes as are of the finest quality and have been cut at the proper season. Fig. 1 shows

a section of the cane of one of these bamboos used in the construction of the larger joints, and it will be noticed that the fibres, shown by the little spot marks, are much denser at the outside than towards the centre, which when the canes are green, is merely pulp. It is only, therefore, this outside part, or rind, that is used in rod-making, and during the process of manufacture the skin must be most carefully preserved from injury, whilst the balancing, &c., of the rod has to be effected before the various strips are cemented together. This is a

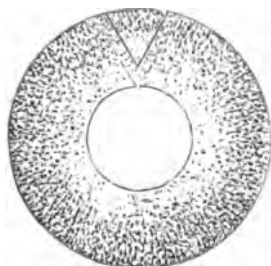


FIG. 1.

matter of great delicacy and difficulty, as will be understood when it is borne in mind how troublesome it is to properly balance a rod constructed of even the ordinary solid woods where the plane can be used after the joints are fixed. Either from want of knowledge or proper machinery, many so-called cane rods are put together so that they have to be subsequently filed or planed to get the requisite spring, thus removing the most essential part of the cane. These inferior rods are then painted, or burnt over again to imitate the natural colour of the original skin, from which, however, they are easily distinguished by experts. The dotted lines outside the V in the engraving (fig. 1) show the shape of the strips as first split out—the interior solid line that of the finished strips when ready for jointing after having been ‘machined.’ The cement used in the process of gluing together is said to be impervious to damp : it is, however, I believe, strictly a trade secret.

Probably one of the reasons why it has been supposed by fly fishers that these rods will not stand the heavy work brought to bear upon them in salmon fishing is the use of inferior cement in the process, and the glue subsequently oozing out of the joints in wet weather, thus tending to make them come loose afterwards. In Mr. Kelson’s report on the collection of salmon

rods in the Fisheries Exhibition ('Field,' October 27, 1883), he observes that 'this is always the case sooner or later with these hand-made rods for salmon ; but if eleven years' experience with them be admitted sufficient, I may say that the rods made with the machinery used by Messrs. Hardy, who obtained the first prize for these split-cane rods at the Fisheries Exhibition, for cutting the cane perfectly true, obviate the difficulty satisfactorily.'

The ordinary butts of split-cane rods, as well as the upper joints, are hexagonal, and are simply made of six V-shaped strips, glued together in the manner described. In the highest class of rods, however, the butt is built double, as shown in the engraving (fig. 2), both the centre and external wall being con-

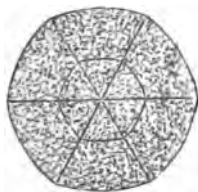


FIG. 2.

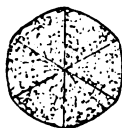


FIG. 3.

structed of separate layers of the hardest part of the cane. The centre is made first in the usual way, and after it has dried the second, or external, layer or wall is built up round it. Messrs. Hardy inform me that although the labour and expense involved in this double construction are, of course, infinitely greater, the strength gained by the process is enhanced to such an important degree that they make all their split-cane salmon rods in this fashion as to the thicker parts. Fig. 3 shows the structure of all the lighter and upper joints of the rod.

Complaints have often been made to me that the ordinary split-cane rod is deficient in casting power as against a wind, and I must say that my experience tends to confirm the truth of the statement. In order to meet this objection, however, Messrs. Hardy and a few other manufacturers have endeavoured

to make the split-cane rods with a steel centre to each joint, so as to increase their 'stiff springiness,' so to speak. The little dark mark in the middle of fig. 4 exhibits this steel centre or core. The spring is first tapered and then tempered in the same manner that the main spring of a watch would be. After this it is coated with a water-proof and finally built up into the centre of the rod.

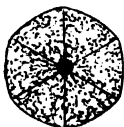


FIG. 4.

I have a grilse or light salmon rod made on this principle by Messrs. Hardy with which I find I can get plenty of power, whether the wind is high or low, and from whatever direction it blows. In the case of a strong head wind especially, I am disposed to think I can make better casting with this rod than with any I ever used, and it is withal a very handy and fairly light weapon : light enough for any description of ordinary grilse or salmon fishing. I find that on a calm day I can cast, with heavy salmon line, over thirty measured yards on the level grass, and this, in my opinion, represents as much as is often wanted to be done in practice ; in fact, most casts with the salmon fly will, if measured, be found, I am satisfied, nearer twenty than thirty yards.¹ Of course, I am aware that there are some rivers and, perhaps, some casts here and there on most salmon rivers, in which a longer rod would enable the fisherman to reach some favourable point otherwise inaccessible, but when this cannot be done by wading I am content to put up with the loss of an occasional good cast in exchange for the constant comfort and convenience which I find in a rod of the proportions indicated.

It is all very well to talk lightly of casting forty yards, and so forth, with a twenty-foot Castle Connell, but the man who wishes to do it, and to go on doing it all day, must be of stronger mould or greater height than the ordinary run of mortals. In my opinion a twenty-foot rod requires a seven-

¹ I fully agree. An ordinary fly fisher seldom casts more than twenty yards properly. ED.

foot fisherman to wield it with comfort, and I am quite satisfied that for all ordinary purposes the salmon fisher would get more comfort and more sport, too, with a rod such as that I have described than with a longer and more fatiguing and unwieldy weapon. . . .

It should be borne in mind as a mechanical axiom in this matter of the length of rod, that exactly in proportion as you gain in casting power by the increased leverage, so (the motive force being equal) do you lose in the propelling power by which only the leverage can be utilised—the practical deduction from which proposition is that every man has a length of rod exactly proportioned to his physical strength—a rod out of which, that is, he can get the maximum of casting force compatible with sustained muscular effort—and that it should be his object to ascertain what that length is. Bearing in mind the mechanical argument, I am disposed to think that a shorter and more powerful rod might in many cases be substituted with advantage for a longer and lighter weapon.

However, as I have said, this is a matter of individual taste, and must be left to the appreciation of individual salmon fishers. Till we have our fly rods made entirely of steel—an improvement which I take it is only a question of time, as it is sure to come sooner or later—the steel-centred split-cane rod above described is probably as perfect a weapon as any fly fisher need desire. I might mention that I have had a shorter top made for my rod which turns it into an excellent rod for pike fishing or spinning for salmon.

Finding from a series of experiments that a rod with a thick top joint had a great advantage over a finely pointed and tapered one in casting a heavy salmon line, I had a three-jointed greenheart rod built for me by Farlow, 'to special order,' as a grilse or light salmon rod. As I think it may be pronounced on trial a success, I give the measurements for the benefit of such of my brother fishermen as may, like myself, prefer a short rod in salmon and grilse fishing. The following are the dimensions :

Length when put together	13 ft. 10½ in.
Weight with ferrules and upright rings, but without india-rubber knob on butt	1 lb. 9 oz.

[The india-rubber knob weighs 3 oz more, but it is of great practical comfort and convenience, and no salmon rod should be without one.]

	in. 16ths
Circumference of butt at reel	3 2
„ „ at middle	2 5
„ „ below ferrule	1 10
„ of large joint at bottom	1 9
„ „ below ferrule	1 3
„ of top joint at bottom	1 2
„ „ 2 in. from top ring	8½
„ of extra stout top joint 2 in. from top ring	10

This rod has about the same cast as the split-cane rod, except in casting against or across a head wind, when the steel-centre rod decidedly asserts its superiority. I can, however, strongly recommend a rod of this pattern to anyone who does not feel inclined to invest in the more expensive luxury of the split cane with steel centre. I did not think in the trials that there was any very decided difference in casting power between the 'extra stout' top and the 'stout' top of which the measurement stands first in the above table. For really heavy work, however, I prefer it as being stronger.

The split cane with steel core makes a beautiful light trout rod. The length of mine is ten feet seven inches when put together, and the weight ten ounces. It has three joints and ferrules. I can cast about twenty-two yards with it on a still day on level ground; and the combination and 'correction' of stiffness and swishiness leave, to my mind, absolutely nothing to be desired.

The following are the weights of ordinary split-cane rods, ounces for feet :

From 10 to 12 ft.	10 to 12 oz.	17 ft.	38 oz.
13 ft.	14 oz.	18 ft.	42 oz.
14 ft.	18 oz.	19 ft.	48 oz.
15 ft.	25 oz.	20 ft.	54 oz.
16 ft.	26 oz.		

N.B.—The steel centres add from 2 to 3 oz. to these weights.

I see no advantage in a single-handed rod much over this length, or say, at the *outside*, eleven feet and a half, as it generally results, in my experience, in both hands being sooner or later called into requisition. If the size of the water demands a larger rod, then I should advise a double-handed rod at once. Such a rod need not exceed fourteen feet, or fifteen feet and a half at the outside, nor weigh more than one pound and a half. The longest and heaviest of my own double-handed rods—greenheart, with a very much swelled butt, three joints and ferules—is an ounce under that weight, and measures fourteen feet three inches. It was built by Messrs. Anderson, of Edinburgh, and is in every respect admirable, as well for lake trout fishing, as for heavy stream work.

Ladies' rods can hardly be too light for real pleasure, as not only their wrists are weaker and their muscles softer than ours, but they have seldom acquired the knowledge of using what physical powers they do possess to the best advantage. This is half the battle, as anyone knows who has tried to lift a trunk that some diminutive porter, perhaps, has just been carrying about in a light and airy fashion as if it were a mere feather-weight. Eight feet and a half, or so, is ample for a lady's single-handed fly rod, and such a rod need not exceed eight ounces in weight. These are the measurements of a rod belonging to a lady of my acquaintance; which is as serviceable and handy a little 'tandem lasher' as a trout can wish to be coaxed with. It was made by Mr. Jas. Ogden, of Cheltenham, who makes these ladies' rods one of his specialities. . . .

In thus describing my four favourite fly rods, I have indicated in the most practical manner I can the description of rod I have found in practice to afford, on the whole, the best combination of qualities for the different descriptions of fly fishing. The rods suitable for lake trolling, worm fishing, salmon spinning, &c., &c. will be referred to under the separate chapters dealing with those subjects.

A table is appended of the comparative weights of rod woods,

computed from the statistics of the Cooper Institute Laboratory in America, by Henry P. Wells :

Distilled water was the standard for determining the specific gravity. The determinations were made with great care, and are believed to be reliable, for the specimens tested, to within at least the third decimal place. Different samples of the same species differ somewhat from one another in weight. The woods which were the subject of this experiment were carefully selected for the express purpose of fly-rod making, and were, as far as was possible, the very best of their kind. It is, therefore, believed that the following determinations more correctly represent the comparative weights of such material as is used for this purpose, than would any samples selected at random in the wood market, or any table computed therefrom.

The split bamboo was of excellent quality, of my own preparation. The six-strip hexagonal piece was taken from an old and well-ried middle joint. The angles of this were slightly rounded. The four-strip piece was put together with the rind inside for the purpose of comparison.

The cedar was taken from a very choice piece from Florida.

The different materials are arranged in the table in the order of their weights, the heaviest first. To facilitate comparison on the part of such as may be unfamiliar with the use of specific gravities, the weight of a cubic foot of each is also given, in pounds and hundredths of a pound.

Material	Specific gravity	Weight of one cubic foot
Snakewood	1.3718	85.74
Bethabara	1.2140	75.98
Greenheart	1.0908	68.18
Lancewood	1.0335	64.59
Split bamboo, 6-strip, hexagonal, rind outside	0.9915	61.96
Split bamboo, 4-strip, rind inside	0.9678	60.49
Ironwood (hornbeam)	0.8184	51.15
Hickory	0.7963	49.78
Ash	0.7786	48.66
Mahoe	0.6607	41.29
Cedar	0.6396	39.98

Before taking leave, however, of the subject of rods and rod fastenings, I should be omitting a most important item if I failed to call the reader's attention to the various improved methods of uniting and fixing the rod joints.

Until the Fisheries Exhibition either called forth, or called into public notice, these inventions, joint fastenings may be said, so far as any general adoption of them is concerned, to be comprised in three descriptions only. The first, the ordinary ferrule joint, in which one joint slips into the other—and it may be added, out of it again with considerable regularity at inauspicious moments; secondly, the spliced joint; and, thirdly, the screw fastening, peculiar, so far as I am aware, to the rods turned out by some Irish makers.

I have one of the last named still in my possession made for me by Martin Kelly, of Dublin, I am afraid to say how many but certainly fifteen or twenty years ago, which has seen some service in its day and is still fit to take the field. I therefore speak of this fastening with respect. It had its drawbacks, however. Perhaps owing to the necessity of the case, or perhaps to the incomplete application of mechanical knowledge, or a little of both, the ferrules which were *attached to the upper joint* and slipped down from above in the manner shown in fig. 1, and subsequently screwed into the position shown in fig. 2, had an awkward habit of breaking at the point where they were attached by a screw or rivet to the upper joint. Consequently, I need not say that since I have become its owner that single-handed three-joint trout rod of about eleven feet, has paid several enforced visits to Dublin for purposes of reparation.



FIG. 1.



FIG. 2.

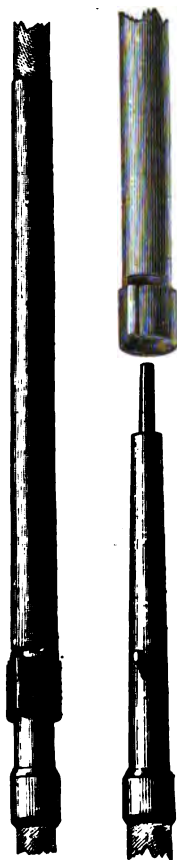
IRISH JOINT.

This 'Irish joint,' as I will call it, had three good points—the opening of the jointure being from below the rod, drippings would not easily find their way into the joint; the ferrule, which is large enough to fit the larger joint, being attached instead to the smaller, there is no cutting away of the latter at what is always the weak point in the rod joint; and, lastly, by the joint being eventually fastened in its socket with a screw the precipitate partings between the different joints, above alluded to, were, of course, entirely obviated. The fault of the fastening is the weakness of the ferrule, inherent or accidental, and the fact that owing to its having to be slipped over, and twisted easily round on, the larger joint, there is always some slight sensation of 'movement,' or play, of the ferrule at this point.

A decided advance on the Irish system above described, though working, to some extent, upon similar grooves, is the waterproof registered rod fastening (see diagram) brought out by Messrs. Watson & Sons, of High Holborn. Fig. 4 shows jointure before attachment, and fig. 3 the joint when fixed in position. The ferrule, as in the case of the Irish rod, is attached to the smaller joint, the attachment, however, being made by accuracy of fitting and not by any screws or rivets. The weak point, if any, in this ingenious fastening would appear to be at the ferrule of the lower joint. Messrs. Watson, however, assure me that it is found in practice to make an exceedingly strong rod. In common with the Irish rod it has the advantage of keeping the water drippings to a great extent out of the joint.

Another rod fastening possessing this latter advantage in combination with some other very excellent points, is the invention, whether patented or not I am not quite sure, of Messrs. R. Anderson & Sons, of Edinburgh and Dunkeld. The upper ferrule is double (*vide* fig. 5 in engraving), having a sort of external sheath, into which the upper inch or so of the lower ferrule slips, and is twisted to its place by the hand. It fits closely, and I can well believe Mr. Anderson's assurance that

it will not slip or change its position in any way during a day's fishing. Fig. 6 shows the joint when united. This joint ought



FIGS. 3, 4.

WATSON'S WATERPROOF JOINT.



FIGS. 5, 6.

ANDERSON'S 'SIMPLEX' JOINT.

to be exceedingly strong, as, whilst the lower ferrule is attached to the thicker joint—which practically never breaks—the upper

joint, carrying also its own ferrule, is not in any appreciable degree fined or thinned away at the point of junction. In fact, as will be seen from the engraving, the upper half of the brazed plug—representing, in fact, the lower end of the upper joint—is quite as thick as the joint itself is above the fastening.

The only possible inconvenience that I see in this fastening is that, should either the lower or the upper ferrules get dented, or damaged in any way, the joint will, of course, absolutely fail to close. But in order to make such a contingency impossible all that is necessary is that the fastenings should have plugs for both halves of the joint. When once jointed together and in position I think the fastening would be less likely to be dented or bulged than any other, being treble—indeed, practically solid—at the point of danger.

Mr. Farlow has exhibited a joint on entirely different principles, namely, that of a movable screw-band attached to the top of the lower ferrule (*vide* diagram, fig. 8) which, when the joints are in position, is screwed upwards, gripping the screw above the brazed plug. The joint when finally adjusted appears as shown in fig. 7.

This joint has, like all the other fastenings described, the merit of being waterproof.

Lastly we have Messrs. Hardy Brothers' 'patent lock-fast' joint, which is also waterproof and thoroughly sound and serviceable. The method of fastening the attachment is shown in fig. 9 of the engraving, where the two portions of the joint are seen separate, whilst fig. 10 shows the joint when locked and in position.

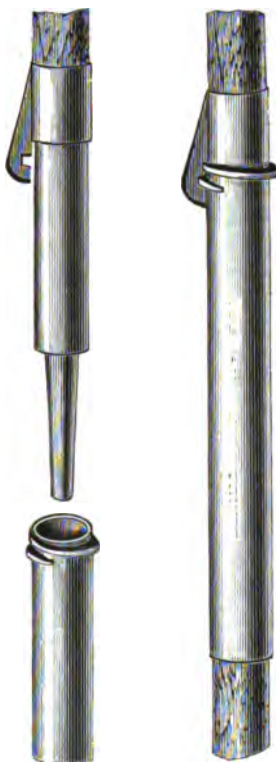
The spiral wire on the outside ferrule gives some additional strength where most required, and Messrs. Hardy's system of brazing an additional short ferrule, the same size as the outside ferrule, on the top of the inside one, is a decided advantage as it strengthens the joint just at the point where so many breakages occur, and is superior to the plan sometimes adopted of putting the inside ferrule on flush with the wood.

Amongst these several rod fastenings the fly fisher can

easily choose for himself. Any one of them will be found in practice immeasurably more convenient than either the old-



FIGS. 7, 8.
FARLOW'S JOINT.



FIGS. 9, 10.
HARDY'S 'LOCK-FAST' JOINT.

fashioned unfixed double ferrule or the spliced joint. The latter gives a good deal of trouble and is delicate and apt to

come to grief, and the former both invites 'stickings-fast,' owing to the admission of the rod drippings, and is also constantly slipping and coming apart, as before observed, at inopportune moments. Personally I shall never again have a rod made with either of them.

If, by the way, the rod joint should become stuck in the manner alluded to, the best and, indeed, the only means that I know of for separating it, is to turn it slowly in the flame of a candle at the 'sticking point,' when the swelling of the ferrule produced by the heat will generally enable a separation to be effected without damage to anything beyond the rod varnish. A little grease rubbed on to the ends of the joints before starting will, especially if the joint be not 'double brazed'—i.e. covered with brass as to the lowest part of the plug—often anticipate 'lesions' of this kind, and prevention is better than cure.

Quitting now the subject of rods, reels, and lines—that is, the apparatus destined for hooking and playing a fish—the next and by no means unimportant question, is the means of landing him.

For all fish of the trout and salmon species up to two or three pounds in weight a net will be found the most convenient and serviceable implement for this purpose—the province of the gaff coming in only in the case of larger and heavier fish. I will not here enter into the vexed questions of net or gaff on salmon rivers, although there is no doubt that nets can be made large enough and strong enough to 'bag' the largest salmon that ever took a fly, and to do all the work of the gaff, and do it effectually, whilst at the same time probably saving the lives of many gravid or unclean fish which ought to be returned to the water. Saving also, when the fisherman is a conscientious observer of the salmon laws, a considerable amount of time and temper.

Putting this question aside, however, the use of the landing net, as I have observed, is practically confined to fish under about three pounds weight, the gaff, on the score of portability,

possessing a decided advantage in the case of heavier weights. Turning, therefore, to the subject of nets adapted for the purpose indicated, we find that the stimulus given to angling inventions by the Fisheries Exhibition has not left us without some distinct advance in this direction also.

The portability of nets, as well as of gaffs, is of primary importance to the trout fisher, who constantly does his work without an attendant. This is one sort of portability. Another is the portability of the net, not as considered with reference to the fly fisher's shoulder or pocket, but in regard to his rod case or portmanteau. A net that does not 'compress' or fold up in some form or other is a most unmanageable and inconvenient addition to a traveller's *impedimenta*, and numerous inventions have accordingly been made to supply this demand. Hoop-shaped nets, both of steel and whalebone, which stretch out at full length and thus form, when not in use, an appendage which can be readily strapped on to, or carried in the rod case, are amongst the ingenious dodges which the inventive talent of tackle-makers or their patrons have called into existence. A less modern invention consisted of a steel hoop in three joints, which, when out of work, could be folded up with the net around it into a shape and compass not much unlike that of the fish itself. This net, however, has the disadvantage of being heavy, and unsuited to the second great requirement in the matter of portability—namely, that the fly fisher or worm fisher should be able to carry his own net, and that in a form and in a position where it would be most out of the way when not required, and most ready at hand when wanted.

This position is undoubtedly under the left arm or shoulder of the fisherman. Here it would or should hang clear of all embarrassments caused by the creel or fish carrier, and ready, of course, to be taken hold of by the right hand of the fisherman, when, at the proper moment, his rod is transferred to the left.

Without occupying space by discussing the merits and demerits of various nets, handles, and net carriers which do not

fulfil these requirements, let me proceed at once to describe a combination which does so. I call it a 'combination' because the net is the invention of Messrs. Hardy Brothers, and the handle and carrier of Messrs. Williams, Great Queen Street, Lincoln's Inn, but I hope by the time this is in print one or both of these firms will be in a position to supply the two in combination, as I am not aware that either is patented.

To begin with the net.

This, as will be seen by the engraving (fig. 1), consists of two side pieces, made of flexible wood, and when stretched to

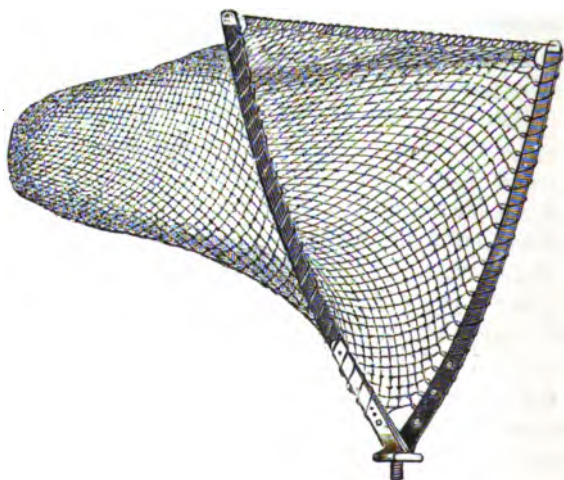


FIG. 1.

their proper dimensions, and so held by the brass socket into which the right-hand side slips, are kept at the regulated distance by a piece of cord stretched between the two upper points. The net itself, as all nets should be—both in order to keep them from getting rotten, saturated with water, or entangling the tackle—is made of fine oiled, that is, 'dressed' silk. It will be readily seen that the shape of this net favours its being carried in the position I have indicated, namely, under the fly

fisher's left arm—for which purpose, however, it is necessary that it should be limited in size, the limit being about a foot in width between the projecting arms. But this allows ample space for netting a fish up to, say, a couple of pounds in weight.

The handle, with the net attached to it in the form in which it hangs at the fisher's left side, and also the cord that suspends it over his right shoulder, are shown in the engraving (fig. 2), where also the dimensions of the different parts of the 'combination net,' as I have called it, are given. In this

figure 'A' represents the net; B, the connecting line at the top; C, the net socket, screwing into a ferrule at the top of the net handle: D is a loose movable metal band held by the projecting rim, F, on the net handle, into and out of which it slips easily; and G is the exterior or lower half of the net handle, connected telescope-wise with the upper joint.

When the net is intended to be used the fisherman grasps it at E, and pulls it at once out of its

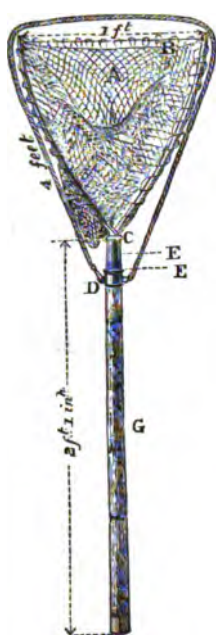


FIG. 2.



FIG. 3.

socket D, in which it hangs suspended only by balance. By a sharp forward and then backward jerk of the net, which he now holds in his right hand, the length of the handle is doubled, and the total length of the net extended to four feet, of which three feet are represented by the handle and one foot by the net (*vide* fig. 3).

This, having regard to the various requirements already indicated, is the most perfect—indeed, the only perfect—net, that I am acquainted with ; but the sole credit which I can claim to myself in the matter, is acting the part of mediator and bringing the two opposite ends of the invention into proportion and juxtaposition.

The advantage of a net of this sort, especially when wading in the middle of a stream, either when fly fishing or worm fishing, can hardly be over-estimated ; and for every sort of fishing where a net is required it will, I feel quite satisfied, be found to give as complete satisfaction to other anglers as it has done to myself. The weight of the net and handle is fourteen ounces. If it should show the least sign of being top-heavy when in position under the shoulder, the addition of a small piece of lead at the bottom of the handle will adjust the equilibrium.

In fishing for grilse, or sea trout, or pike, when fish do not run over five pounds, and, indeed, even if of larger size, a gaff may be substituted for the net, and the same handle and carrier will answer equally well for this purpose also. In cases of heavy fish a more powerful and solid gaff handle is desirable. This, of course, presents no difficulty when, as is usually the case, the salmon fisher is accompanied by an attendant who carries both the weapons and spoils of war. But should it happen that 'Donald' is 'too late' and that the salmon fisher has to depend on himself for gaffing his fish, a large gaff with a handle only a few inches long, and a knob at the end that he can slip into his coat pocket, will be found most convenient. Some time is, of course, required in killing a fish under such conditions, as he must be brought within arm's

length of the fisherman who has only got his left hand with which to 'show him the butt,' as the expression is; but that it is a perfectly practicable performance I can testify, having done it over and over again myself, sometimes in the case of very heavy fish. Indeed, even when I have had an attendant carrying the ordinary long-handled gaff, I have frequently preferred gaffing the fish with it myself rather than run the risk of the clumsy treatment which it is too likely to receive at his unskilful or unpractised hands.

It is curious how difficult it is to become a really first-rate gaffer. Indeed it seems to be an accomplishment as a rule entirely beyond the reach of the uneducated, or half-educated, man. I fail at this moment to recall more than two or three instances—notable ones, I admit—of a gillie or keeper being really an adept in the art, and not once, but constantly I have, I fear, disgusted my professional 'fisherman'-attendant by either gaffing my fish myself with the right hand, whilst the rod was held with the left, or summoning to my assistance the trusty friend and companion of many a red-letter day's salmon and pike fishing to whose steady nerve and skilful hand I owe not one but scores of fish that would never otherwise have been brought to bank. . . .

On a very rocky bit of the upper part of the Usk where we—Mr. Edwin Darvall and myself—have killed some hundreds, if not indeed thousands, of *salmonidæ*, the gaffing business was the despair of my friend's faithful henchman, Timothy—as it is written of him:

The wily Tim with dextrous gaff
Tries hard to cut the line in half;

and I am afraid he has many a time thirsted for my blood when his master has insisted upon my depriving him of his 'wand of office' at the critical juncture. On one occasion the wily Tim not only succeeded in thus cutting the line whilst failing to gaff the fish, but also, by what Artemus Ward would call a 'dextrous movement,' managed to bring the gaff point

into contact with the flank of his master's favourite bull-dog. Between the imminent peril to his legs on the one side and to his head on the other, the faithful Tim's chances of getting off with a whole skin were at that moment not worth a pin's purchase ; but Fate came to his assistance—the gaff turned in the handle, thus releasing its astonished and howling victim, and his master's gathering wrath found vent in a peal of irrepressible laughter. 'Pongo,' however, who I was delighted to meet a few days ago as broad and as 'bull-doggy' as ever, will bear the gaff mark till his dying day.

Gaffing in really rapid torrents is a matter of considerable physical as well as artistic difficulty, and the choice is frequently between Scylla on the one hand and Charybdis on the other. It is often necessary to gaff 'when you can,' to snatch a passing stroke, that is, in the middle of an intervening shallow, or to take a mean advantage of the glimpse of a back fin as it is carried past in a whirl of foam by its still struggling, though retreating owner. In trying these impromptu conclusions, however, the victory is not always with the gaff. Repeatedly, I have seen—and I may say felt!—the bearer of the gaff dragged head over heels into the stream by the vigorous efforts of a salmon which he was endeavouring to gaff before it was, to use angling vernacular, half-killed. Many similar catastrophes I have seen averted only by an ignominious let-go of the gaff, and it has more than once happened to me personally to be saved from a ducking by the gaff handle or hook or both giving way.

I well remember a tussle of this sort when fishing the Usk, two or three years ago, below Pantysgallog Bridge. I had hooked a heavy fish under the fall—at this spot a series of 'rushes' over sharp gradients—and he at once headed straight up-stream for the heaviest of them, half-foam half-water. Here he 'sulked,' and nothing I could do would move him. The keeper was invisible, but I managed to get hold of the gaff from the bank where it lay, and then by some slight exercise of agility secured a foothold on a flattish rock right over where

my friend was taking it easy. Throwing back the rod over my left shoulder, and tightening the strain on the fish as much as possible, I contrived with the right hand by sheer muscle to force the gaff down to the bottom, right under where he was lying—a depth perhaps of two and a half or three feet. A lucky stroke upwards did the rest at the first attempt. I shall never forget the rush that fish gave. For an instant or two it was ‘pull devil, pull baker.’ But, with the weight of water on him, four hands instead of one might have failed to haul him out. In the present case, it was perfectly evident that he on the contrary would haul me in. I felt I could not hold on another moment, and yet could not bring myself to let go; when suddenly the gaff twisted, I imagine, in the socket, cutting the line as it came away, and leaving me to struggle my way back to *terra firma* as best I could.

A long, deep, still pool, some two or three hundred yards long, stretched away below the fall, and down the bank of this I wended my way towards the next cast, in a sufficiently unamiable frame of mind. Suddenly my eye was caught by something that looked like a huge bar of gold wavering slowly with the current about mid-stream. I guessed in a moment that it was my late antagonist who, poor fellow, had gotten his death as well as his liberty. With an impromptu grappling tackle I succeeded after a few attempts in hooking and bringing him to bank. He was not quite dead, however, but still made a feeble fight, and was game to the last; like Hotspur—

. . . in bloody state

Rend’ring faint quittance, wearied and out-breath’d.

Another, somewhat ludicrous, incident of this sort occurs to my memory, although the successful party in the encounter was, I believe, on this occasion a pike. I say I ‘believe,’ because the whole of his body except his tail fin was deeply embedded in weeds from which it would have been impossible to extricate him by any legitimate method.

It was on the Hampshire Avon at Summerley, the beautiful

seat of Lord Normanton, to whose courtesy I have been indebted for many a charming day's pike fishing, that the incident in question occurred. My trusty friend and *alter ego*, Mr. Darvall, and myself, with Lord Normanton's fisherman, Tizard, were paddling our way slowly down stream in one of the small Avon punts, when we suddenly caught sight of this TAIL, 'broad as the baldrick of an earl,' gently undulating in an opening in the water lilies. The fish was evidently a huge one; the chance of tempting him to be caught *secundum artem* was *nil*; Tizard earnestly assured me his master was most anxious to have a large pike for the table—and so—I yielded to the tempter. . . . The boat glides noiselessly down to the unconscious *esox*, and now the gaff is steadily but surely stretched over the spot where leviathan's shoulder is likely to be, giving him an imaginary length of about four feet. . . . *Whish!* There was a rapid 'stroke,' a plunge, and with a rush sufficient to have upset a whale boat the stricken monster dashed for the bottom of the river, at that point at least twenty feet deep.

It was an exciting moment. I found myself being pulled incontinently over the boat's side, which was taking in water freely, and clutched at the nearest available support, which happened to be the seat of the keeper's corduroy nether garments. It came bodily away in my grasp. . . . At this juncture nothing, as I believe, could have saved the boat from capsizing, if the gaff, yielding to the excessive strain, had not first twisted in the socket and then *straightened out*—thus, of course, releasing the enemy, who, though deep struck, may, I would fain hope, have yet survived the indefensible attack made upon him, *contra bonos mores*, and lived on to attain a still greater age and a yet vaster breadth of tail.

Tizard, the keeper, was the only one who did not laugh heartily; but on a hint that we should contribute to his next tailor's bill his countenance resumed its wonted serenity. *Some of us* on the occasion had certainly, however, a narrow escape of being drowned . . . and the verdict of all good pike fishers would doubtless have been—'and serve them right.'

While I am on the subject of my poaching experiences let me make a clean breast of it and relate how, when a young man, reading at a tutor's on the banks of the Thames, my finer perceptions were on one occasion blunted, and my better feelings done violence to, by the sight of a splendid specimen of *Esox lucius* in one of the stew ponds of Mr. Williams, of Temple, the then member for Great Marlow. That morning I had seen him (the pike) lying basking, and in the afternoon (I can hardly tell to this day how it could have happened) I found myself, for some unexplained reason, standing by the side of the aforesaid stew pond, and wondering whether anyone would see through the surrounding withy beds, topped by a notice board threatening legal pains and penalties against trespassers? What is still more inexplicable, I carried in my hand an extra long sort of walking stick—or, shall I say it at once? *hop pole*—and in my pocket a coil of what certainly bore an external resemblance to copper wire. A couple of feet of this wire had somehow got on to the end of the hop pole, whence it dangled in such a manner as almost to deceive the eye into the notion that it was not altogether unlike the abomination commonly known amongst certain persons of impaired moral perception as a noose or 'sniggle'. . . . Hop pole in hand, I bent carefully over the water and reconnoitred the position of my friend *Esox*—merely in order, of course, the better to admire his majestic proportions, as he supported his huge body on his ventral *pinnae*, and 'feathered' the water with his pectoral and caudal fins.

'A delicate monster, truly,' I observed, 'quite an ichthyological study.' And simultaneously an uninitiated spectator might have imagined that the appearance of the noose aforesaid passed gently but quickly over his head and shoulders. . . . There was a curious sudden commotion in the water; and at the same moment a rustling in the withies behind—and then a well-known voice (being, in fact, that of Mr. Williams' head water bailiff and fisherman) was heard, in accents the sarcastic tones of which I shall never forget, observing: 'Well, Mr. Pennell, this 'ere *be* a pretty go!'

‘Confound you,’ said I, furious with conflicting emotions, ‘you’ve made me lose him—a twenty-pounder if he was an ounce!’ . . .

‘Well, what is to be done, sir?’ was the next remark.

By this time my wrath had cooled down a little and I instinctively felt in my waistcoat pocket. It was empty.

‘Unluckily, Edwards,’ I said, ‘I have left my purse behind.’ ‘Oh! never mind, sir,’ was the reply, ‘everyone knows your *credit’s good at the Bell!*’

Pecavi! ‘How sad and mad and bad it was’! . . . I should like to quote—if only to ‘keep myself in countenance’—the confessions of Mr. Thomas Westwood (poet, and author of ‘*Bibliotheca Piscatoria*’), which he makes in one of his charming angling idyls, the ‘*Lay of the Lea*.’ Not that I would

Drag his frailties from their dread abode,

but merely that, as he is an old friend of mine, I should like to do my best to give his confessions the publicity that I know he would desire for them!

Bobbing ’neath the bushes,
Crouched among the rushes,
On the rights of Crown and State I’m, alas! encroaching.
What of that? I know
My creel will soon o’erflow,
If a certain Cerberus do not spoil my poaching.

The ‘certain Cerberus’ being, in fact, the Government water bailiff employed to look after the well-known Enfield Powder Mills. Still I must say Mr. Westwood’s crime was of a far less heinous complexion than mine. He only fished, fairly, where—well ‘where he didn’t ought to’—whilst I . . . but let me drop the veil over these sad examples of human depravity, and come back to gaffing.

The ‘queerest fish’ that it ever happened to me—to gaff, I was going to say, but I remember that on this occasion it chanced to be to net—was a wild duck. Spinning one day

for pike on Loch Lochy I saw the duck—an overgrown ‘flapper’—swimming not thirty yards from the boat. The idea occurred to me to try and cast over him, and after a few attempts I had the pleasure of seeing the bait settle gracefully across his neck. A ‘gentle stroak,’ as Nobbes calls it, and the next moment he dived, and, ‘playing’ like a veritable fish, never came to the top again till I had him at the side of the boat and passed the landing net under him. An hour afterwards he was roasting before a drift-wood fire on a spit of arbutus; and washed down with a glass of genuine ‘Long John’ he made a most excellent lunch. ‘These to his memory!’ . . .

It is wonderful what an appetite the air of a Highland Loch gives—a thing most excellent when one has the wherewithal to satisfy it; but I often think it must be ‘hard lines’ on the Gaelic tramps and gipsies—if there are any so far north of the country of ‘Meg Merrilies’ (Galloway). I once had myself the experience of a supperless tramp with a friend in these ‘high latitudes,’ and the recollection has by no means that ‘enchantment’ which ‘distance’—we had covered some thirty miles of ground more or less—ought proverbially to lend. When it is getting dark and a man has distinctly lost his way in a country where there are no roads, and no visible population, it is the wisest plan to yield as gracefully as may be to the ‘inevitable;’ and if he cannot, like Mark Tapley, be ‘jolly under circumstances,’ at least to do the best he can for his bodily comfort, without waiting till he has taken the last mile out of himself, and left his physique too much exhausted to contend on fair terms with damp grass and night dews.

Acting on this view, we utilised our ‘last mile’ in ‘prospecting’—and eventually made ourselves a fairly comfortable shakedown of heather under the shelter of an overhanging rock—*sub tegmine* fern-i. But now we began to feel the air-effect upon our appetites, and to remember that we had been on the go since breakfast and had eaten nothing. We were in fact starving! A raw turnip would have been a godsend, and

a dish of potatoes a wild delirium. But there was nothing for it, so we put on whatever extra in the way of garments we had in our knapsacks and turned in fasting. What my friend's dreams were about I cannot say, but mine ran on lakes teeming with fat luscious trout which came up to be caught of their own accord, and then, to save trouble, jumped spontaneously into the frying pan. Assuredly these visions must have been prophetic ; for though we fondly imagined we had camped on a plateau of bare and unbroken moorland, when morning dawned the scene had been transformed as by magic,

‘And on a sudden, lo ! the level lake,
And the long glories’ of the rising sun !

The sight of water—and water doubtless containing trout—gave, as Ingoldsby says, ‘a new turn to the whole affair.’ I fortunately had my fly rod with me, so I left my friend to make a fire as best he could and

. . . stepping down
By zigzag paths, and juts of pointed rock
Came on the shining levels of the lake.

Without stopping, like the bold Sir Bedivere, till ‘both my eyes were dazzled,’ I soon put together my rod and adjusted a cast of flies. Never before did I fish with such energy ; never did I watch for a rise with such breathless attention ! The first fish I hooked was a mere ‘troutling’—little bigger than a gudgeon—who would at other times have been incontinently returned to the water ; but circumstances being as they were I played and landed him and deposited him on the bank with as much care as if he had been a five-pounder. He was two mouthfuls at any rate. A friendly breeze, however, shortly afterwards sprang up, and with the ‘long ripple washing in the reeds’ a satisfactory repast was soon provided. . . .

Later on we discovered a farmhouse hard by the lake shore, and finding that the trout fishing in the Laggan and neighbouring Spean-water was excellent—we arranged to put up for a week with its hospitable inmates, and enjoyed really

first-rate sport, more than once being literally unable to carry home our spoils. I revisited the spot some years later, but whether I had incautiously betrayed the whereabouts of our 'happy hunting grounds,' and they had been invaded by tourists, or whether the trout thought they had done enough for me on my first visit, I cannot say, but the fishing was indifferent, not to say decidedly poor.

.



FIG. 1.
INCORRECT FORM OF GAFF.



FIG. 2.
CORRECT FORM OF GAFF.

But where am I wandering to? I started at gaffing salmon, and I find myself now describing the catching and eating of half a dozen troutlings, whose united ounces would not have outweighed a Devonshire peel. . . . Let me for the sake of consistency finish where I began, and end this part of my notes on Tackle with a few practical hints on the subject of Gaffs and How to Gaff a Fish. To the novice, at any rate, they may not be altogether useless. And first as to Gaffs :

All sorts of mechanical deformities are manufactured, and sold in the tackle shops, as 'gaffs,' of which a good example is seen in the turned-out point of fig. 1—a facsimile of a gaff bought of a well-known London tackle-maker. Fig. 2 shows the correct shape, arrived at by the application of the same simple principles of mechanics already discussed in regard to ordinary fish hooks.

The skilful use of the gaff, besides demanding special qualities, can only be acquired in perfection by actual practice, and circumstances 'beyond one's control' are constantly occurring which of necessity make their own laws, and the best-considered system inapplicable. The following are, however, a few axioms that can be safely formulated as general guides.

1. Never thrust your gaff forward until you are prepared to strike, and never make any half-attempts. These feints generally scare the fish and not unfrequently cut the line.

2. Under *ordinary* circumstances do not attempt to gaff a fish that is more than a foot below the surface, or until he is pretty fairly spent. The best position is when he is 'broad-side on.'

3. The proper place to gaff is between the head and the back fin.

4. The critical moment having arrived, rapidly, but at the same time steadily, extend your gaff over and *beyond* the back of the fish, bringing it gently down upon it, as it were. Then a short sharp jerk from the wrist and elbow will drive in the gaff without prematurely frightening the fish or endangering the tackle.

After landing the fish, whether by net or gaff, the next point is to carry him.

If the catch be a good one, especially of salmon, it is practically out of the question for the fisherman to carry them himself from place to place and fish at the same time. '*Necessitas non habet legs*,' as a friend of mine once dog-latinised it, and these conditions are, of course, also a law unto themselves. In trout fishing, however, or where the spoils are not likely to be weighty, the fly fisher, and still more the worm fisher, will pro-

bably very often have to carry his fish himself. For this purpose bags and baskets 'many and great' are sold at the tackle shops, but that they are most of them defective in some points in which they might have been perfected, goes without saying. In fact, as regards the bags (which for ordinary purposes I always use myself), I have found them mostly to suffer the disability of coming to pieces—if not the first time they had a good catch to carry, at any rate, after say a few days or weeks of wear and tear.

This is partly owing to the manner of their construction, and partly to the material. In regard to the latter, the important thing to be aimed at is that the material of which they are made should be thoroughly strong, and at the same time sufficiently waterproof to prevent dripping, or the saturation of the wearer's clothes. But this is the difficulty. Waterproof composed of actual india-rubber has not only an objectionable smell itself, but appears to impart it to the fish as to everything else with which it comes in contact. I have accordingly had a fish bag made by Mr. Farlow of a material that, both in texture and a reasonable degree of 'waterproofedness,' fulfils the conditions indicated. The material is a close-woven, light-brown-coloured canvas, of which also I usually have my leggings made for field shooting, and its durability and wet-resisting qualities first suggested the idea of its employment for fishing bags. It has no smell of any kind.

The engraving (fig. 1) shows the bag or carrier in its closed-up condition—A being the strap, or rather 'webbing' (for leather becomes both sodden and chilly when wetted) by which it is suspended over the shoulder; B is a light waterproof (fastened by its own straps), which I find it a great convenience to carry with me when fishing or shooting, attached either to bag, basket, or cartridge carrier; and C is an extra-stout 'webbing,' so adjusted that when fastened in the position shown in the engraving, the whole of the portion of the bag which contains the fish is *completely surrounded and supported by it*. Fig. 2 is the bag with the extended ends open,

as they would be in the event of large fish having to be carried. The dotted lines in this figure show the position of an extra carrier, placed at the back of the bag, in which luncheon,



FIG. 1.



FIG. 2.

tackle, &c.—or, on an emergency, fish—can be conveniently stowed.

Of course, when closed, in the form of the ordinary bag, the

extending ends, A A, are turned inwards instead of outwards, and are there held in their places by two strips of side webbing, as shown in fig. 1. The idea of this bag is not an original one. Who was the first inventor thereof I do not know. For the details of construction and waterproof arrangement I might, however, possibly claim some credit, excepting that I have already found my reward in the numberless wet-jackets from which it has saved me.

A very good-sized bag for the trout fisher is one foot four inches in length by 11 or 12 inches in depth ; the extreme length of the bag, with the side flaps extended, being about two feet nine inches, which is large enough to carry a fifteen-pound salmon or pike at a pinch. For salmon and pike fishing, however, a considerably larger size will be found more convenient. The shoulder strap, or rather webbing, in the smaller size, should be at least two inches wide, and in larger sizes two and a half or three inches. The weight of the smaller sized bag is one pound six ounces (or with the waterproof coat complete 2 lb. 12 oz.), and that of a basket, such as fig. 4, 3 lbs.

In deciding upon the question of bag or basket I personally prefer the latter in every respect but one, and that is that when you have caught nothing the latter conceals, whilst the former exposes only too palpably, the nakedness of the land. To gentlemen who are sensitive on this point I can only suggest a plan adopted by an ingenious, I am afraid I cannot say ingenuous, friend, who on such occasions has been known to fill the 'aching void' by an adequate supply of lumps of turf or brickbats !

Some fishermen consider that the 'appearance' of the fish is better preserved in a creel or basket, than in a bag in which they are liable to be occasionally squashed or squeezed out of shape. To such connoisseurs I commend one or other of the following creels, also the outcome of the 'Fisheries,' or at least first then brought to my notice.

Figs. 3 and 4 are diagrams of what is known as 'Hardy's Carry-all Creel.' It is made, as will be observed, in two pieces

or compartments, the object being to carry the fish in the lower, and the luncheon, tackle box, &c., in the upper part. It

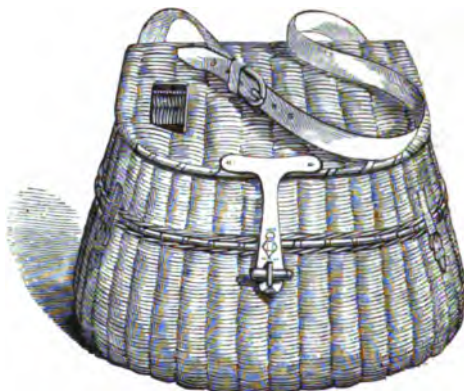


FIG. 3.

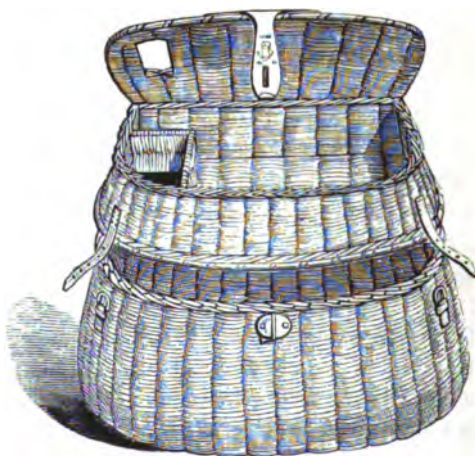


FIG. 4.

is a very complete and handsome creel, and in many respects a great improvement over anything before brought out.

Fig. 5 is a creel intended to embody the same idea and brought out by Mr. Charles Farlow, of 191 Strand. In this creel the space for stowing away the tackle &c. is made by a double back, the lunch case, book, and flask being fitted into the spare compartment in the position shown in the engraving. In this latter creel an innovation has been made in the way of the carrying apparatus. There are two separate bands or supports of webbing, the one perpendicular, so to speak, and the other lateral. The perpendicular support passes over the left shoulder and the lateral one round the waist of the fisherman.



FIG. 5.

This leaves, of course, his right shoulder and arm perfectly free for work, and, as far as I can judge without practical experience, would answer exceedingly well for fishermen with tolerably square shoulders. Whether there would not be an inclination to slip off in the case of a less symmetrically proportioned figure I have my doubts.

This special method of carrying, however, is not a necessary part of the invention ; which in itself is, I must say, admirable.

Following up the subject of the fly fisher's equipment let me strongly advocate the use of waterproof leggings or trousers whenever wading is really necessary. When it is not

indispensable several self-evident advantages are presented by fishing from *terra firma*. By getting wet and remaining so are engendered many of the after ills that flesh is heir to, in the shape of rheumatisms, neuralgias, varicose veins and what not, which when 'wild youth's past,' are apt to remind the veteran of his early indiscretions. I occasionally suffer martyrdom myself from lumbago—the result of 'fairy follies' in the bootless wading line before I had sown my wild oats, and used to look forward to standing (?) in the water from 8 o'clock in the morning till about the same hour of night as 'half the fun.' To have unfrolicked such fun I would now give a good round sum—say to the Temperance League, as my share of the 'water rate'—better give it to them than to the druggists! . . .

But I shall touch upon this theme in the next volume, and will therefore only repeat here my *caveat*—Don't make a practice of going into the water without waders.

In the matter of waterproof boots, &c., there is such an *embarras de choix*, that I can hardly suggest anything on the subject likely to be of practical use. It matters little in my opinion, whether the waders be of india-rubber or leather, so that they keep the legs dry and *have plenty of nails*.¹

It is astonishing what 'heights and depths' one can scale or cross in safety with a salmon at the end of the line, which it would be sheer madness to attempt in cooler blood. I recollect once when fishing the Roughty, near Kenmare, getting my fish fast round a stone under the opposite bank. The river at the point was about forty yards wide; deep; and the water discoloured by a fast rising flood; nevertheless by dint of jumping, and striding

¹ A recent writer in the sporting press, under the signature of 'Watchet,' recommends the following ingenious plan for insuring a good supply of nails without any risk of their leaving holes in the actual sole, which would have the effect of making the boots un-waterproof. He has nails 'put into a rather thin gutta-percha sole, and the ends of the nails which protrude through the sole flattened down (easily done by hammering on an iron weight). This sole, armed with nails, is then fastened with gutta-percha to the sole of the wading boot. The points of the nails being bent and flattened down, they hold well in the lower sole, and cannot injure the upper one by penetrating it, as they would if left protruding.'

like the Rhodes Colossus from point to point of rock, submerged or projecting, I managed to get across to the other side ; *sed revocare gradum* ? . . . After killing my fish, a very fine fifteen-pounder with the tide lice on him, I was fain to walk a good three miles round before I could find a fordable place.

Talking of the Roughty reminds me of a gallant and enthusiastic salmon fisher 'quartered' in the neighbourhood at the same time that I was. The Major was remarkable for his steady absorption of 'poteen,' which he invariably carried, when fishing, in his pocket in a soda-water bottle. On one occasion whilst following fast after a fish that was tearing down stream he successfully 'negotiated' a post and rails—successfully, that is, as far as the fence was concerned ; but his activity cost him dear, for the sacred soda-water bottle, flapping about in his coat-tail pocket, jerked up as he jumped, striking him in the mouth and knocking two of his front teeth clean out. The gallant Major's language on the occasion I shall not soon forget ! . . . But the Roughty was a real sporting river, and many a break-neck scamper I have had along its channel—pity it was so netted and poached.

I could fill pages, as no doubt most salmon fishers could, with anecdotes of escapes or catastrophes in the wading and ducking line : personal explorations plummet-wise of widths 'obvious' but depths 'uncertain'—trifling errors in hydrostatics on the force of currents—unsuccessful 'negotiations' of the 'water jump,' &c. &c. For such emergencies wading trousers are decidedly preferable on many grounds to boots or leggings. They are also, I believe, far less dangerous, as, in case of having to swim for it, instead of getting instantly filled with water, the latter takes a 'measurable' time to make good its entry. An impression used to prevail that in case of sudden immersion the trousers would buoy up the legs at the expense of the head—the latter performing the office of a sort of plummet, and of course, barring accidents, involving a certainty of drowning to the wearer. Actual experiment has, however, completely exploded this fallacy. Mr. John Lloyd, junior, who published a

letter on this subject in the 'Field' of September 7, 1867, thus describes his experiences :

FISHING TROUSERS.—I always wear these in preference to stockings, but have been somewhat alarmed of late by my friends suggesting that if I were suddenly to slip off a rock into deep water with them on, I must be infallibly drowned ; that it did not matter how good a swimmer one might be, there was no hope of safety. The confined air in the trousers would cause one's legs to stick up almost out of the water, while the head would be kept down. The thought of such a catastrophe was most unpleasant, so I resolved to try the experiment, having a boat at hand in case of need. I therefore put on the trousers, reeving the string at top as usual round my waist, and dived head foremost into deep water. The result agreeably surprised me, for I found that my legs were gently buoyed up in a horizontal position near the surface of the water, while my head was well above it, and I could use my arms freely in swimming.

I swam with the greatest ease for about fifty yards, and it was not for some minutes, and until the water had found its way between the reeving string and my body into the trousers, that I felt any inconvenience from having them on. My legs then began to get heavy, and more depressed in the water, but not so as to prevent my swimming easily.

I am convinced, therefore, that there is no danger in using fishing trousers ; on the contrary, if reeved pretty closely at the top, they will act for the first five minutes positively as life buoys. It is not until after they fill with water that they become dangerous. To prevent this, therefore, as long as possible, it is in all cases most advisable to reeve the trousers tightly round the body, you can thus confine the air and exclude the water.

The same may be said of fishing stockings and wading boots ; a reeving string round the thigh would in these have the same beneficial effect.

To this the late editor appended the following note :

[We are especially obliged to Mr. Lloyd for having taken the trouble practically to disprove such a very disagreeable belief as has heretofore existed in this matter, as his published experience cannot fail to be most valuable. It is to be hoped, however, now that the thought of danger from this cause is dispelled to some extent, anglers will not, on the other hand, become as reckless as

they have hitherto been careful. One thing by the way, did Mr. Lloyd swim up stream or down? The filling of the trousers would be very sensibly affected by this, we should imagine.—ED.]

The above experiment was in *still water*.

It therefore seems that waterproof trousers add greatly to the safety of wading. If, however, it is desired to 'make assurance doubly sure,' it appears wading trousers can be manufactured with an air-inflated edge—a sort of swimming belt in fact—which enables the wearer to face all contingencies of the drowning category with perfect equanimity. Messrs. Cording, the well-known waterproofers, of 125 Regent Street, referring to the letter from Mr. Lloyd, wrote :

We beg to suggest that all chance of drowning can be avoided by having an inflated edge round the top, which will also prevent them filling, as if a person gets out of his depth he still keeps in a perpendicular position, and one could cross a deep stream in safety, and without the water going over the tops. If properly made the inflated part would not be at all in the way, and would add but very little to the weight. We made some for the Viceroy of Egypt on the same plan, which were much approved of.

Messrs. Cording have never lost sight of this idea, and are now manufacturing to order wading trousers with safety apparatus attached to the top—'Life Belt Wading Trousers' they call them—for which they obtained a medal at the Fisheries Exhibition. The 'life belt' part of the affair consists of a tube about six inches wide when lying flat, which comes under the shoulder, being attached to and forming part and parcel of the waders. This tube or belt is inflated when in use.

One further hint : *the higher the trousers come up the better* ; but trousers that only reach to the waist are very little better for practical purposes than high boots. Of boots, perhaps the best, on the whole, are those lined with leather, and having waterproof on the outside. These are the least trouble of any in putting on and off.

If leather boots are preferred the best dressing I know to keep them both supple and waterproof, is the 'Threpperderme,'

or penetrating oil, shown at the late Exhibition, which I have since used with excellent results for all sorts of leather and porpoise-hide fishing and shooting boots. It has the merit of being perfectly easy to apply, and of being practically free from smell, also it never 'cakes' on the outside of the boots. The Threpoderme is far from an expensive dressing, and can be got at any of the Co-operative Stores.

Boots of brown canvas to wear over wading stockings and trousers were also exhibited by Messrs. Cording at South Kensington. The speciality of these is that they have holes, just above the sole, by which water is allowed to escape, and gravel &c. kept out. Also being of soft material above the soles, they can be worn over the wading trousers without a sock between.

Whenever waders are used, thick warm woollen stockings, and leggings also if possible, should be worn inside. Excellent woollen garments of all sorts are now manufactured and sold by the celebrated Dr. Jaeger's Sanitary Clothing Company—who also exhibited at South Kensington—at the offices, Prince's Street, close to Oxford Circus. I cannot imagine why some more simple and convenient style of dress has not long ago been adopted by 'lady fishers,' as well as by anglers of the sterner sex. Many ladies who now would never dream of approaching the river bank (nearer than the towing path) for fear of spoiling their dresses or wetting their shoes, would if suitably 'apparelled' find as keen an interest and enjoyment in the sport as we do, and might even become enthusiastic votaries of the gentle art. How charming it would be when we sally forth after breakfast to lake or stream, to have the companionship of some 'sweet girl graduate,' who, with hair either golden or otherwise, would by her graceful companionship double the pleasures of success. There would be no slovenly casting, no callings to halt for pipes or liquor when fish were on the rise then.

Fight on, brave knights ! Bright eyes behold your deeds,
written of the 'free and easy passage of arms' of Ashby de la

Zouche, finds its modern parallel in the hunting field, the polo ground, and the rifle tournament, in fact, wherever youth and ambition meet in the presence of beauty to try who is the best man. From this category no one who has watched the keen interest with which the spoils of the day's chase are discussed at the dinner table and the number and magnitude of each capture appraised and determined, can except the 'knights of the angle.' There are indeed already not a few angling champions of the gentler sex who now enter the lists, especially as fly fishers, and amongst whom the fair daughters of a well-known noble Duke have acquired enviable fame.

We are not all, however, so lucky as to have a salmon river at our door, and I have often thought, watching some modern Dame Juliana punt fishing under the dip of a Thames chestnut tree in August, or later in the autumn sending her spinning bait skimming into the foam below Hurley weir, how much of pleasure, now lost to most of us, is gained by the man whose wife takes heartily to fishing or hunting or whatever other field sport he is devoted to. In this way she becomes not only his helpmate at home, but his 'chum' and true comrade when on his rambles by flood and field, or, rifle in hand, mounting the 'imminent deadly breach' which is shortly to witness the campaign against chamois or red deer.

Not that shooting is a sport by any means so naturally fitted to women as fishing. Their figure makes the handling of the gunstock always rather awkward, and the recoil is sometimes apt—unless very light charges are used—to be dangerous. But to fishing there is no drawback, unless, indeed, it be the petticoats with which some thick-ankled leader of fashion in bygone times has managed to cramp and disfigure one of the prettiest parts of the human form. No skirts will vex the tameless ankles of our women of the future. Already there is a marked and healthy improvement visible in the length of the dress, and women need no longer draggle about behind them a ridiculous and often muddy train, which if it

does not do duty for a road-sweeper cannot certainly be shown to subserve any other useful purpose.

The influence of dress has been recognised by many philosophers as exercising a powerful effect in moulding the national character, and I am quite satisfied that if English men and women, and those living in town as well as in the country, were to adopt a dress allowing greater freedom and play to the limbs and muscles, and (so far as men are concerned) would discard, once and for all, chimney-pot hats, frock coats, leg bags—I use the term literally, not in a slangy sense—and the other paraphernalia of the bandbox, there would be a marked advance in the manliness and ‘robustness’ of the race.

Women who shoot or fish should never hesitate to wear a dress suitable for the purpose ; long skirts are not only constantly in the way, but often prove a source of real danger to the wearer. The same remark holds still more true in regard to long riding habits, and if the readers of these lines had seen as many accidents, and hair-breadth escapes from accidents, in the hunting field, as I have, owing to long skirts, they would join in the outcry which ought, in the name of common sense, to be raised against them. However, I am glad to see that there is some improvement of late years in this respect also.

In arranging a lady’s fishing dress, next to the short skirts thick boots more or less waterproof are the most important item, having regard both to protection and comfort ; but this is precisely the point on which the male adviser finds the greatest difficulty in procuring a favourable hearing for his views. Simply on the score of ‘prettiness’ it cannot be said that a stout double-soled shooting or fishing boot is as killing as a Queen Anne slipper, Louis Quatorze shoe, or a pair of dainty *bottines*, expressly designed to set off and emphasise the delicate arch of the instep, whilst displaying the foot and ankle in a position which, if not quite natural, is at least exceedingly picturesque.

— The flower she touched on, dipp’d and rose,
And turned to look again.

But, my dear lady readers—if I should be so favoured as to have any—do not let it be forgotten that there is ‘a beauty of fitness,’ and that where really rough work has to be done ‘ease before elegance,’ and, it might be added, ‘health before both,’ is a golden maxim.

The following hints for dress, which have been kindly given me by a lady who has had large practical experience with both rod and gun, may possibly be found of service :

Short skirt of linsey wolsey made as simple as possible—in fact, a kind of ‘housemaid’s dress.’ Norfolk jacket made of *all wool* material. A comfortable toque (the close-fitting toque does not catch the wind). It is best to have the costume of one colour, say a nice heather mixture or whitish grey. I advise ‘linsey’ for the skirt, as it is everlasting in wear, and the ‘all wool’ for the Norfolk jacket, being warmer and more healthy.

Now for the most important item—boots. They should fit perfectly, and be made of porpoise hide, with honest broad soles and plenty of room for the toes, and flat heels—in their proper place, *not* under the arch of the instep. The boots should lace in the same way that men’s shooting boots do, and be made to come well up the leg (so that gaiters can be dispensed with). Length of skirt an inch or so above the ankle.

This dress is suitable for either fishing or shooting. If worn for the latter over a ‘clayey’ country, a few inches of light waterproof on the bottom of the skirt are advisable. Some ladies wear gaiters, but I think if the boots are made high enough they are not necessary. ‘All wool’ under-garments should be worn, from stockings upwards.

The comfort to the fisherwoman, as well as to the fisherman—and, indeed, to all sportsmen—of boots which are both thoroughly easy and at the same time completely waterproof, is so obvious that I make no apology for offering a few hints on the subject, the more so that during experiments extending over some decades I have myself suffered ‘many things at the hands of many bootmakers.’ Any bungler in the trade can, of course, make at least a passably waterproof boot if he allows himself unlimited latitude in the matter of weight and clumsiness, or ‘stiffness.’ The art is to make a

boot waterproof, and at the same time light, and as soft to the foot as a kid glove.

For 'waterproofing' all cloth and woollen materials—I do not say making them actually waterproof, but sufficiently so to keep the under-garments practically dry—I can recommend the following receipt, given me by R. Atkinson, Esq., of Temple Sowerby :

Dissolve sugar of lead and alum in *rain* water, one ounce of each to a quart of water. When settled down, draw off the clear (this is most easily done with a syphon), *saturate* the *woollen* article in it (I generally leave it in twenty-four hours), and dry in the open air. From my own experience I have found a coat thus treated to be quite waterproof. For a few days there is an unpleasant smell, but it soon wears off. I infinitely prefer such protection from rain to any macintosh or other india-rubber manufacture.

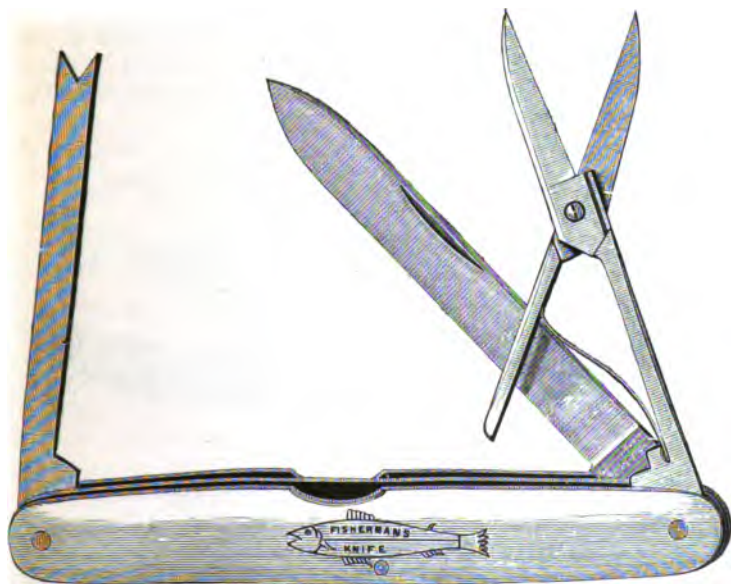
FISHING ETCETERAS.

I might under this heading fill a chapter, if not a volume ; as taking the term in its broadest sense, fishing 'etceteras' might be made to embrace the entire contents of a tackle shop, less the half-dozen prominent items of the fisherman's equipment which I have already noticed. But I must leave these minutiae to take care of themselves, as space warns to bring this chapter to a close.

In doing so, however, I would briefly refer to three minor items which may be of use to the fly fisher.

The first is a fishing knife—an almost indispensable addition to a satisfactory outfit for the river-side. The diagram above represents the most convenient form of knife that I know of ; containing in a small compass—the engraving is of the actual size—scissors, knife, and 'disgorger blade'—three implements which are liable to be called into requisition at every turn. This knife is manufactured and sold by Watson & Sons, 308 High Holborn, and the price is either 6s. or 6s. 6d., I forget which.

The second 'etcetera' is a rather bulky one, being in fact a fishing boat ! As such boats made of inflatable india-rubber can now be obtained at several waterproof manufactories, and at a reasonable price, and as the comfort of one of them on many fishing expeditions, especially in lake districts, is simply not to be exaggerated, I think fishermen who can afford the luxury will be wise to make a portable boat one of their items



A KNIFE FOR FLY FISHERS.

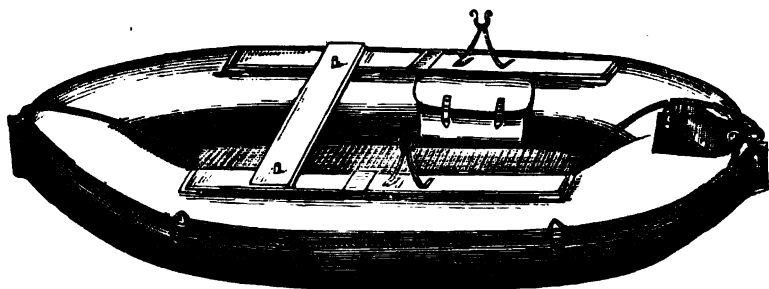
of travelling equipment. They are made to hold 'any number' of people, and even a boat of the smallest size is steady enough for all the purposes of the fly fisher.

The boat figured in the engraving on page 108, which obtained a prize at the late Fisheries Exhibition, is made by Messrs. Cording, waterproof manufacturers, Regent Street.

The Berthon¹ folding boat is also exceedingly well adapted to fishing purposes. The Marquis of Exeter has tried several different patterns of these boats, and speaks very highly of them. I forget the exact weight; but one shown at the Fisheries Exhibition, seven feet by three feet, to carry two persons, could be easily lifted by a small boy.

C. W. Meiter & Co., of Gracechurch Street, also obtained a prize for their folding boats, of which the smallest size draws only two inches of water and is claimed to be 'unsinkable.' It is about 10 per cent. more expensive than the Berthon boat.

The last item is an appliance for clearing flies from boughs, sunken roots, logs, &c., the invention of the Rev. Eardley C.



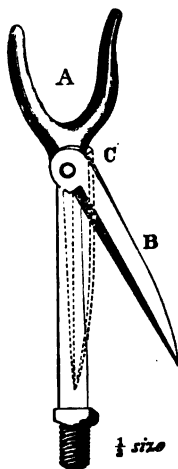
CORDING'S COLLAPSING FISHING BOAT.

Holt, of Upper East Sheen, a thoroughly practical fisherman, and a profound student of angling literature.

The illustration on page 109 shows the apparatus reduced to half the normal size. A is a fork or prong for pushing, or, as it were, 'disgorging' the fly from whatever has got hold of it; B is a strong sharp cutter, for severing an antagonistic bough that is beyond reach with the hand, and C is the joint on which B works, the dotted lines showing its position when not required for use. The whole screws into the socket of the net or gaff handle.

¹ Berthon Boat Company, 50 Holborn Viaduct, E.C. The price of the boat described is 8*l.* complete.

So now I have said my say about rods and rod woods, reels, reel lines, hooks, knots, and angling paraphernalia generally; and I repeat that I am not so sanguine as to suppose that anything I have adduced will convert a single veteran to deviate a hair's breadth from his own approved patterns and theories, to add a few eyed hooks to his fly case, or to shorten the length of



MR. EARDLEY HOLT'S CLEARING KNIFE.

salmon rod a single inch. . . . And this is just as it should be. Uniformity would be monotonous, and I am all for 'liberty of conscience' especially in matters piscatorial. These pages may, however, possibly meet the eye of the tyro just about to start on his first angling campaign, and if any hints I may have thrown out should help him to equip himself effectively I shall be pleased.

*NATURAL HISTORY OF BRITISH
SALMONIDÆ.*

A KNOWLEDGE—even if only a very moderate one—of the natural history and habits of fish is generally admitted to be an important element of success in angling. The history of the salmon and trout species is especially interesting, in some of its aspects even important, as bearing on the national supply of fish food, and I therefore make no apology for prefacing, by a sketch of their habits from the Angler-Naturalist's standpoint, the chapters descriptive of the practical art of catching them.

In this essay I have adopted the division or grouping of the different species of British *Salmonidæ* in two great classes : the silver, or migratory, and the yellow, or non-migratory ; the first division consisting of those fish which migrate periodically to or from the sea, viz. the true salmon, the bull trout, and the sea trout ; and the second division of those the habits of which usually or constantly confine them to the fresh water, whether lake or river, viz. the common, or yellow trout, the great lake trout, and the grayling.

[In this second division must of course also be included the varieties of the charr and of the coregonus, or fresh-water herring ; but the habits and history of the latter are of less interest to the fisherman than to the ichthyologist, as they are confined to special localities and so far as I am aware never, or 'hardly ever,' take either bait or fly.]

This grouping commends itself not only by its simplicity and convenience of classification, but also by such broadly marked distinctions in regard to habits, localities, &c., as must override distinctions founded upon mere technical differences.

Of the silver or migratory division of *Salmonidæ*, the first in place, in virtue both of its pre-eminent qualities as a food fish and its precedence in the estimation of fishermen, is the

SALMON (*Salmo salar*).

Forty or fifty years ago comparatively little was known of the natural history of the salmon. Of theory there was a superabundance ; in fact it was rare to come across a salmon fisher, to say nothing of a salmon 'legislator,' who had not some pet hobby of his own on the subject, ready to be trotted out on the parliamentary or any other plain at the smallest provocation.

Descending, however, from theory and speculation to actual knowledge, the united lore of those most interested in the salmon fisheries amounted to little beyond the bare truism that the fish ascended the rivers to spawn during the spring and summer—spawned—and descended again to the sea within the following two or three months. This, I say, was the state of our salmon knowledge some forty or fifty years ago.

The last two decades, however, witnessed a very marked and important advance.

The researches of ichthyologists and the experiments which have been conducted on a large scale by enterprising and scientific men have thrown a flood of light upon the subject, converting doubts into certainties, theories into practice, and generally advancing our knowledge to a point which has been productive of most important reforms in the management of our exhausted salmon fisheries, and in the establishment of new ones.

Amongst those to whose exertions in the practical, per-

haps, rather than in a scientific, point of view, we are indebted for much of our advancement in this field of knowledge and the attendant legislation which has effected so great an improvement in our fisheries, may be mentioned the late Mr. Ffennell, Commissioner for Irish, and afterwards Inspector of English, Fisheries, and the late Mr. Frank Buckland, who for his services in the cause of salmon reform, was also appointed one of H.M.'s Fishery Inspectors. Many others worked successfully in the same direction—and deserve well of those interested in salmon and salmon fishing. Of my own share in bringing about the present improved state of affairs I need say little. My efforts, successful or otherwise, have been more than acknowledged by the press, and I may, perhaps, be pardoned if at the present time, when a great reform has been actually effected, I recall them with a certain sense of satisfaction. Not many years ago, indeed, it was remarked in an article in the 'Saturday Review' that 'Mr. Pennell, Mr. Buckland, and one or two others have worked hard in the cause of salmon reform in spite of territorial apathy, and if ever again we have this fish as cheap as it was in the days of the mythical "apprentices" it will be mainly owing to their exertions.'

It was expressly with a view of strengthening the hands of the Government in the salmon fishery reforms then pending that I projected and edited for some years the 'Fisherman's Magazine and Review' (afterwards absorbed in 'Land and Water'), and I believe I was one of the first who ever codified, so to speak, the law of salmon history. To the following condensed summary, published in the 'Times,' I do not know that more recent researches have made any additions necessary.

PROVED FACTS IN THE HISTORY OF SALMON.

1. Salmon and grilse invariably spawn in fresh water if possible—both the eggs, and the young fry whilst in the parr state, being destroyed by contact with salt water.
2. The eggs are usually deposited on gravelly shallows,

where they hatch in from eighty to one hundred and forty days, according to the temperature of the water. Eggs remaining unhatched beyond the latter period will seldom hatch at all.

3. The eggs deposited by the female will not hatch under any circumstances unless vivified, after exclusion, by the milt of the male ; and—at least up to the period of migration—there is no difference whatever in fry bred between salmon only, between grilse only, between salmon and grilse—between salmon and parr, or between grilse and parr.

[*Note*.—The female parr cannot spawn ; but the male parr possesses, and constantly exercises, the power of vivifying salmon and grilse eggs.]

4. The fry remain one, two, and, in some cases, three years in the rivers as parr before going down to the sea—about half taking their departure at one year, nearly all the others at two years, and the remainder (which are exceptional) at three years old.

5. All young salmon fry are marked with bluish bars on their sides until shortly before their migration, up to which period they are parrs ; they then invariably assume a more or less complete coating of silvery scales and become smolts—the bars, or parr marks, however, being still clearly discernible on rubbing off the new scales.

6. The young of all the species of our salmon and trout, migratory and non-migratory, have at some period of their existence these bluish bars ; and consequently such marks are not by themselves proofs that fry bearing them are the young of the true salmon (*Salmo salar*).

7. Unless the young fish put on their smolt dress in May or early in June and thereupon go down to the sea, they remain as parrs another year ; and without smolt scales they will not migrate, and cannot exist in salt water.

8. The length of the parr at six weeks old, is about an inch and a half or two inches ; and the usual weight of the smolt before reaching the tidal wave from one to two ounces.

9. In at least many cases, smolts thus migrating to the sea in May and June return as grilse, sometimes within five, generally within ten weeks, the increase in weight during that period varying from two to ten pounds, the average being from four to six pounds; and these grilse spawn about November or December—go back to the sea—and (in many cases) reascend the rivers the next spring as salmon, with a further increase of from four to twelve pounds. Thus, a fish hatched in April 1854, and marked when migrating in May 1855, was caught as a salmon of twenty-two pounds weight in March 1856.

10. It appears certain, however, that smolts do not always return during the same year as grilse, but frequently remain nine or ten months in the sea, returning in the following spring as small-sized salmon.

[*Note*.—It will thus be seen that the fry of salmon are called *parrs* until they put on their migratory dress, when they become *smolts* and go down to the salt water; *grilse* if they return from the sea during the first year of their migration; and at all other periods *salmon*.]

11. It has also been clearly proved that, in general, salmon and grilse find their way back to spawn to the rivers in which they were bred—sometimes to the identical spots—spawn about November or December—and go down again to the sea as 'spent fish,' or 'kelts,' in February or March—returning, in at least many cases, during the following four or five months as 'clean fish,' and with an increase in weight of from seven to ten pounds.

[*Note*.—Shortly before spawning, and whilst returning to the sea as kelts, or spent fish, salmon are unfit for food, and their capture is then illegal. 'Foul fish' *before* spawning are, if males, termed red fish, from the orange-coloured stripes with which their cheeks are marked and the golden orange tint of the body; the females are darker in colour, and are called black fish. *After* spawning the males are called kippers, and the females shedders or baggits.]

This, in a condensed form, is the present state of our positive knowledge as regards the leading facts in the history of salmon.

The irregular return of salmon from the sea, referred to in

paragraph 10, which, I believe, I was the first to call attention to, will be found to explain many apparent anomalies and irregularities in the habits of salmon in different rivers as observed and chronicled by local fishermen and others ; and the time may come when under a more minute and complex system of salmon legislation it will be found to have an important bearing upon the regulation of our fisheries.

In tracing the history of the salmon we will begin with the adult fish on their ascent from the sea, whether as salmon or grilse. At varying periods during spring and summer months *a proportion at least* of salmon in the bays and estuaries of the coast make their way up the rivers for the purpose of spawning—their general colouring at this period being a brilliant silvery white, merging into a bluish black with a few dark spots on the upper part of the body and head.

When first ascending from the sea, salmon are termed 'fresh-run' fish, and are then in the most perfect condition both for the rod and the table.

A fresh-run salmon may not only be generally known by the bright silvery hue on the belly and sides, but also, when just up from the sea, by a species of parasite, or sea louse, which may be frequently found attached to the fish. These, however, are killed by a few hours' contact with fresh water, but the salmon exhibit for some time after the marks or scars left by the parasite.

The periods of ascent and spawning of salmon differ in different rivers—are earlier or later, that is, in point of time. Streams issuing from large lakes, in which the water has previously undergone a sort of filtering process, and has become warmer, owing to the greater mass and higher temperature of its source, are often what would be described in angling parlance as 'early rivers ;' whilst, on the contrary, streams which are liable to be swollen by the melting of snows, or cold rains, or which are otherwise bleak and exposed, are frequently later in season, and yield their principal supply when the great

lake rivers are beginning to fail. Of these operating causes two of the Sutherland streams afford good examples. One, the Oikel, springs from a small exposed alpine pool some half mile in breadth ; the other, the Shin (a branch of the Oikel), takes its rise in the deep sweeping waters of Loch Shin and its tributary lakes. The Shin joins the Oikel about five miles from the sea. Early in the spring, all the salmon entering this common mouth diverge at the junction, pass up the Shin, and thus return, it would appear, to their own warmer stream ; whilst very few keep the main course of the Oikel until a much later period.

Nor does it appear that these operative causes and their resultant effects are confined to Scotland. An analogous instance, indirectly traceable to the same cause, has been pointed out by Dr. Heysham, in his 'Catalogue of Cumberland Animals,' as observable in several of the rivers of that county : The salmon, during winter and spring, evidently prefer the Eden to either the Esk, Caldew, or Peteril, although the Eden and the Esk pour their waters into the same estuary, and, in fact, are only separated at their mouths by a small promontory. There is hardly an instance, Dr. Heysham asserts, of a salmon entering the Esk until the middle of April or beginning of May—a circumstance always referred by local fishermen to the difference in temperature between the two streams. The waters of the Eden, they allege, are considerably warmer than those of the Esk, which, from the shallow and rocky character of the bed of the Esk, appears not improbable.

Be this as it may, it is an indubitable fact that snow water prevents salmon from running up even the milder stream of the Eden.

The Caldew and the Peteril, again, pour their waters into the Eden, the one at, and the other a little above Carlisle ; yet up neither of these rivers do salmon ever run, unless at the spawning season, and then but in small numbers.

The rule, however, which would appear to be inferred from

the instances quoted is far from being invariable ; and as it has been found that the time of salmon ascending and spawning frequently differs in neighbouring rivers of the same district—in some cases even where their sources and channels are apparently of a similar nature—it is very possible that we have yet to arrive at the whole truth respecting the causes of these variations.

With regard to the sort of resting places or holding grounds which salmon most frequent, they appear, as often as not, to be guided by sheer caprice. There are some pools which, to the angling eye, or, at any rate, the uneducated angling eye, are apparently perfection, and which yet seem never to hold a fish from year's end to year's end, or if they do hold a fish they are fish which cannot be induced to take the fly or bait. Indeed, there are particular stones in particular rivers behind which for some inscrutable reason, salmon will almost invariably be found. I know just such an one in the Conway, and there is another, if I recollect rightly, in the Tweed. It does not signify how often the salmon sheltering behind these stones is caught—I have known three thus taken in one day—his place appears to be filled again almost immediately.

Still, notwithstanding this capriciousness of salmon in the choice of water, there are some general rules which may serve as approximate guides to the salmon fly-fisher when unassisted by local knowledge. Where the bed of the river is of bare or naked rock, unbroken by ledges or 'shelters' of any sort, salmon—or, at any rate, rising salmon—will rarely be found. All sorts of shelters and rocky excrescences are, no doubt, in themselves favourable for salmon, both as affording shelter from the stream and a point of outlook from which fly and other bait may be advantageously perceived ; but, as Mr. Stoddart also points out in his 'Angler's Rambles,' the ledges of rock and large stones to which salmon instinct inclines 'will invariably be found, when the salmon are settled down, to lie in conjunction with or in the vicinity of a firm gravelly "alveus."'

Elsewhere, Mr. Stoddart illustrates this fact by the

Garry, the course of which from Faskally upwards through the pass of Killicrankie is 'mildly rapid and its bed strewn over with rocks and boulders of every dimension. . . . One not fully versed in all the outs and ins of salmon fishing, proficient as he might be in the use of the rod, becomes so deceived as to construe the interspersed breaks and shallows, the flush of water passing through the tired eddies, the jutting shelves which gleam underneath—the whole build, in fact, of the channel—into a series of admirable resting places for the fish. . . . But the truth simply is that in resting humour no fish are ever there. Such are not the spots where the instinct of salmon induces them to halt at and show appetite. Proceed farther up. Climb from its torrent termination to the head of the pass, to the point in the course of the Garry where the distribution of the rock becomes alternated also with stretches of alluvial deposit—in fact, with spawning ground—and in the pools favoured by such a combination you will find that not only are salmon to be met with, but that they are to be met with in a position which prompts and enables them to come readily towards the offered lure of the angler.'

As observed, however, the caprices of salmon with regard to the particular parts they favour or reject, and even as to the position occupied by each individual fish, where there are several in the same pool, are most curious. Possibly the latter arrangement may be dependent upon some 'first come, first served' principle—a sort of piscine recognition of the rule of *beati possessorum*. Where salmon are very numerous indeed, as for example in the Galway River, I have seen whole shoals which for some reason appear intent on 'keeping themselves to themselves,' and from whose ranks straggling was evidently interdicted. These different shoals were almost always of different sizes. An interesting example of this was noticed by my friend, Sir Charles Mordaunt, in the case of a pool in a well-known Scotch river. In a letter to me he says: 'Once, when the water was too low for fishing, a friend and I had the opportunity of very closely observing the salmon as they lay in "ranks"

near the tail of the pool. Crawling to the bank's edge, and cautiously putting our heads over, we could see everything that went on below. In the front rank there were five large fish only, one apparently of about 30 lbs., the others running perhaps from 20 lbs. to 25 lbs. In the second rank were fifteen ranging from 15 lbs. to 20 lbs. ; in the third twenty-three from 10 lbs. to 15 lbs., and in the rear rank the Grilse, some thirty-two in number. All the fish were motionless except for the slight action of the tail fin necessary to keep them up to the stream. We then sent the keeper round to stir them gently by throwing a stone in behind the Grilse, which caused the whole body to move up into deep water ; but after waiting about an hour we saw them begin to return to their former quarters, where by degrees they took up their original formation in perfectly "dressed" ranks, and without a fish missing.

'When the water was barely high enough for fishing, I could still command a sight of the bottom of the pool, although not a perfectly clear one. As the fly passed over him, a salmon before rising invariably turned on his side. . . .'

To return to the subject of salmon migration. Allowing for the exceptions previously pointed out, the order in which fish ascend rivers is generally somewhat as follows : The strong, early runners come first. These are succeeded by the grilse, and by the small 'spring salmon' which have probably never ascended at all as grilse, but have remained in the sea since the smolt state—a period of from eight to ten months, as noticed in 'Proved Facts,' No. 10. The tails of these spring salmon are not so forked as those of grilse. A few of them generally appear with the early-running fish.

As the season advances, the larger fish and those heavy with spawn begin to work their way upwards from the mouths of the rivers and estuaries towards the higher reaches ; and such fish continue ascending from the sea until the close of the autumn, or, if the river be an 'early' one, of the summer. Even as late as November and December, and the January

and February following, a few fish continue to run which have been usually considered as 'barren'—without capability of spawning; but this notion was proved by the late Mr. W. F. Ffennell to be erroneous. Upon dissection he found that the females had ova in them perfectly developed, although not larger than mustard seed, whilst in the males a thin thread of milt was always discernible.

These fish, of which many ascend the Tay in November and the three following months, remain nearly a year in the fresh waters before spawning, and although their colours gradually become darker in consequence, they are to all intents and purposes 'clean fish,' and are exceedingly good eating.

The term 'clean fish' is used as the antithesis of 'foul fish'—a term applied to all salmon which have either not recovered from the effects of spawning, or in which the roe or milt has arrived at a great degree of maturity.

The so-called barren salmon appearing at a time when most fish are spawning, or are just recovering from the process, illustrates what I believe to be the most important fact connected with the history of salmon, viz. that the principle of a *divided migration*, already referred to, is not confined to the parr on going to the sea, or to the smolts on their return from it, some as grilse, and some as spring salmon, *but that it also extends to the old and adult fish after spawning*—one portion of these latter coming back into the rivers during the following summer, and the rest not until the spring succeeding it; in other words (and this is the gist of the whole), that at least a proportion of salmon *spawn only every alternate year*. The design of this law or instinct—which, when once apprehended, will be found to explain many of the perplexities in the history of the salmon—is intelligible enough. It is evidently to insure a supply of clean fish throughout as large a portion of the year as possible, and to enable each river to support the greatest stock—a result which could only be obtained by such a provision as the above. It is also doubtless intended to insure an equal distribution of fish throughout the whole length of the river. These salmon,

by ascending thus early, before their spawn is at all matured, are vigorous, and able to overcome the obstacles in their upward course to the extreme sources of the river—to which those fish remaining in the sea until heavy with spawn could never penetrate.

Curiously enough, an analogous fact has been noticed with regard to the spawning of the common trout. Dr. Davy, who was in the habit of opening the fish he caught, records that by this means he discovered that, as the spawning season approached, only about one-half of the females had visible eggs, whilst in the other half there were *no signs of the development of the ova*. Charr, also, are frequently taken in Windermere in high condition in October and November, which is their regular spawning season—a fact which would seem to point to the possibility of the rule of alternate spawning years holding good in the case of all the fish of the salmon and trout species.

But to return. The ascent of salmon to the spawning grounds is usually somewhat in this wise. During the early part of the season, the fish in the rivers, which do not at once ascend, remain in or near the mouths. But with the advance of the season they get gradually farther into the fresh water beyond the influence of the sea. The edible quality of the salmon when thus ascending rivers depends entirely upon the state of development of the milt or roe—a loss of condition, accompanied by the usual change of colour, following, even in the salt water, upon the maturing of the spawn. The efforts of the salmon to surmount all obstacles to their ascent of the rivers increase with the approach of the spawning time, and they shoot up rapids, and make wonderful exertions to surmount cascades and other impediments, frequently clearing a height of two or three yards at a bound. It has been calculated that, when swimming, or rather darting at full speed, the salmon will glide through the water at the rate of about 1,500 ft. per minute, or upwards of 400 miles per day—a pace which, if it could be maintained, would speedily carry the fish round the world.

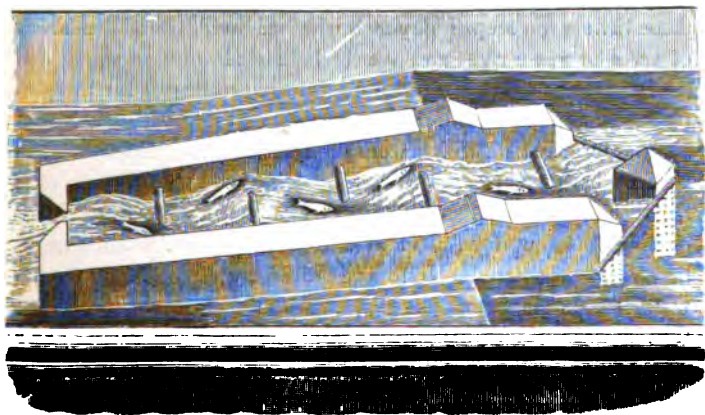
Although the height to which a salmon will leap seems

wonderful to those who have watched the process, we may well hesitate to accept all the 'tall stories' on the subject which have been put on record, with more or less show of authority. No doubt the depth of water from which the spring is taken materially influences its height; but I should hesitate to assert that I had myself seen a perpendicular leap exceeding ten or twelve feet—and I have seen some thousands. Sometimes, as in the Falls of the Beaulieu, the ascent is by a single bound, at others, as at the Rogie Falls on the Scotch Blackwater, by a sort of double jump, necessitated by the shape of the fall. Frequently the fish are actually killed by the exhaustive violence of their exertions or the injuries caused by falling back on the rock.

Lord Lovat, as is well known, has a salmon leap where, in consequence of the local conformation, a kettle of boiling water can be so placed that the fish literally jump into it and are boiled.

Salmon ladders or stairs by which the fish are enabled to surmount high weirs and other obstructions have proved of infinite value to the fisheries, and will, it is to be hoped, come into yet more general and extensive use. The difficulty, of course, is to obtain the running water-supply without diminishing, or interfering with, the water-power of mill streams or lessening their supply—matters which have hitherto given rise to much dispute and embroilment between the rival owners of mills and of salmon rivers. As, however, it has been pointed out by Mr. J. H. Horsfall—inventor of the water economiser, for avoiding a loss of 'head water'—such an interference or injury to milling interests can only occur when the river is low and when migratory fish do not run, and at such time no properly constructed fish ladder need have any water-supply. When, however, the water rises and fish do run the water required for the supply of the fish ladder is merely a surplus which the miller neither wants nor uses. It is, of course, quite possible and, indeed, does not require much ingenuity to erect fish passes or ladders in such a way or in such a position that they prove only partially effective or entirely useless. The

points to be considered are, *a*, the placing of the ladder in the most suitable part of the weir ; *b*, the proper incline of the ladder ; and, *c*, the supply of water which is admitted to it. As Mr. Horsfall once wrote to me, no two weirs are alike, and in his experience the proper position of the ladder can only be shown by actually watching the habits of the fish at the dam, and the points towards which they naturally head in their efforts to ascend. There is a limit to the steepness of an efficient fish ladder—one in four being, I believe, the maximum slope which can be safely calculated upon. Next to this the point of



greatest importance is that the ladder should be supplied with a greater flow of water in proportion than that running over any other part of the weir, as when salmon and any other fish in their ascent up the river meet with any obstruction they seem instinctively to be attracted to the part where the stream is the strongest.

The engraving is taken from the first model fish ladder which was approved by the Inspectors of English Salmon Fisheries and officially recommended for a weir thirty feet broad and six feet high. The principal dimensions are as follows :

Total length from apex to base, including thickness of walls	38 ft.
Total width " " " " "	9 ft.
Length of watercourse inside walls 	32 ft.
Width of " " 	5 ft.
Length of spaces between steps of ladder, about . .	5½ ft.
Width of side openings in steps 	9 in.
Width of central opening in top steps and at bottom . .	12 in.

The model of this ladder, with some diminutive salmon and trout fry to represent the ascending fish, was for some time exhibited at the Home Office, and afterwards at the Horticultural Gardens, South Kensington. A prettier sight it would be difficult to find, whether to the naturalist or the utilitarian. On these little water steps it depends whether hundreds of thousands of acres of waste river and sterile lake shall remain waste and sterile or shall be converted into training nurseries for the production of the most interesting, as well as the most valuable, of all the great classes which were commanded to multiply and fill 'the waters in the seas.' Certainly the little *Salmonidæ* took kindly enough to the fish ladder even as babies and were always on the look-out for the chance to go 'upstairs.' They might be seen moving anxiously to and fro with their noses up stream waiting for a start, and the moment the freshet came (the water, that is, was turned on), up they went, jumping and racing like a school of boys turned out for a half-holiday. The slope of the ladder I am describing was one in five; one in seven or eight is, however, very preferable when circumstances will admit of it, and, as I have stated, one in four is the maximum. This ladder was intended to be built of masonry, but sometimes the ladder is constructed out of the rock itself—that is, all except the steps. A portion of the side of the dam or fall is partitioned off and intersected at considerable distances by transverse steps of wood or stone, each intersection crossing about two-thirds of the whole width, and the fish are thus, 'step by step,' taken up to a height of thirty or thirty-five feet, or higher if necessary.

The longest fish pass or passage that has ever been attempted was that made some twenty years ago by the proprietors of the Galway fishery, in Ireland, between Loughs Corrib and Mask;

the fall between the two lakes being twenty-eight feet and the length of the pass no less than one thousand feet. The pass was nothing less than a huge iron trough, like half one of the large water-pipes seen in the London streets, and about three feet in diameter. The trough, which was made in England and transported to Galway in separate pieces, was then fixed in its place with coping stones and cement, at an expense which may be easily imagined. It is some years since I have visited Cong, and whether this splendid attempt has been successful in 'salmonising' the 23,000 previously barren acres of Lough Mask I am, therefore, unable to say. I remember the opinion of the late Mr. Ffennell and of Mr. Frank Buckland was far from encouraging on the point.

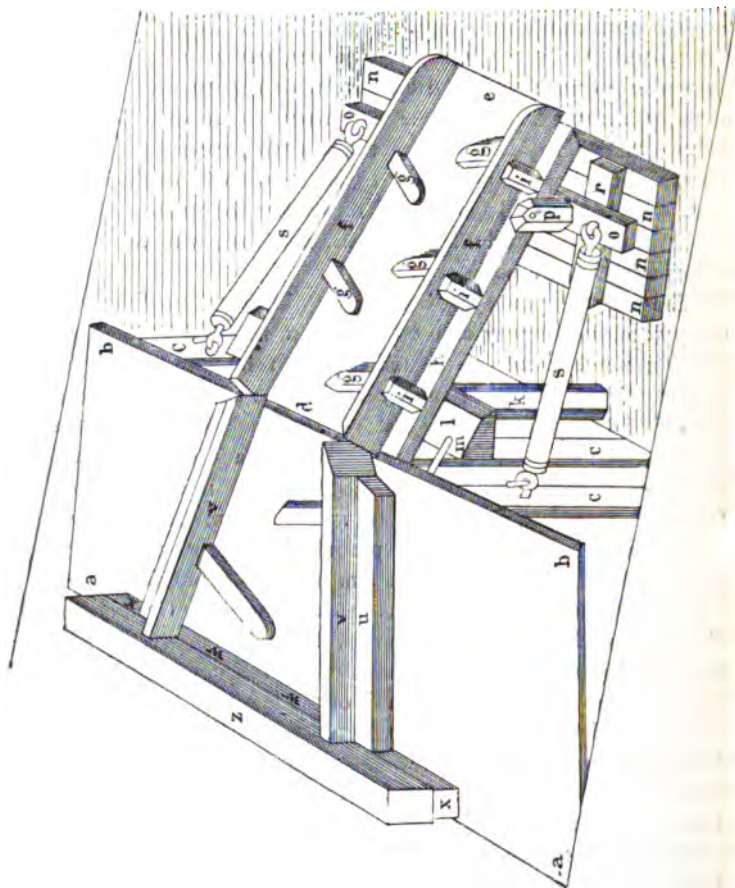
The great expense of ladders in different situations has often stood in the way of their adoption, mostly to the detriment, it need hardly be stated, of the fishing in the upper reaches of the river. It may, therefore, be interesting to the owners of fisheries, who are not already acquainted with the very cheap and efficient floating salmon ladder lately constructed by Mr. Anton Pietsch, at Kurczyn, in Hungary, to present them with a description of it, accompanied by such an explanatory diagram as would probably enable any tolerably intelligent engineer to erect a similar one in practice. For this description, which is translated from the German of Dr. M. Nowicki, of Krakow, by Mr. R. B. Marston, editor of the 'Fishing Gazette,' I am indebted to the courtesy of that gentleman, as also for the diagram of the ladder.

Dr. Nowicki says: 'At Kurczyn, on the river Poprad, in Hungary, there is a high weir which prevents the salmon getting up to the spawning ground, and has caused a falling off in the number of salmon.

'It was therefore decided in connection with the attempt which was being made at the time to increase the salmon in the Weichsel district, to open up the Poprad river again to salmon. Count William Migazzy, President of the Upper Hungarian Fisheries Society, and to whom the improvement

in Hungarian fisheries owes so much, took steps to provide the weir with a salmon ladder at his own expense.

'The construction of the ladder was entrusted to the



PIETSCH'S L₃ MOVABLE SALMON LADDER.

forest officer at Kurczyn, Mr. Anton Pietsch, who carried it out in a most creditable manner, inasmuch as at very small cost he made a wooden *movable* ladder, which he attaches to

the weir every year in the autumn. The idea was, at any rate, an original one as compared with the multiplicity of kinds of fixed ladders of massive build—those in use in Great Britain, for example. This ladder answers admirably in practice, and met with entire approbation from the members of the Fish-breeders' Conference which was recently held at Dresden. It may therefore claim to be somewhat particularly described here and brought under more general notice, especially as Herr Pietsch has had the great kindness to supply for this purpose the accompanying design and also give instructions in the use of the ladder.

'The wooden weir (*a b c*) occupies the whole width of the river—about one hundred and twenty-five yards. Its face (*c*) rises perpendicularly to a height of over three yards in a low water, so that except in a high flood the difference of level between the water below the dam and that above is too great for salmon to overcome, and for just this reason the use of a ladder is imperative. The broad dam head (*a b*), with gentle slope, is boarded horizontally; its ridge (*a*) is horizontal lengthways, and without crown. Below the dam are several deep pools, in which the salmon lie, and it is over one of these just below the weir that the fish pass is placed.

'The ladder (*d e*) has parallel sides (*f*), and a level bottom (*d e*) is made of strong two and a quarter inch planks, sixteen feet four inches long, three feet six inches wide. The blocks (*g*) are placed widely apart to allow room for large salmon to move about between them easily. The height of these blocks corresponds with the depth of water required for salmon, and the fall is that of the floor of the ladder. The ladder rests on strong beams (*h*) and is kept in its place by several small posts (*i*) which are let into the beams. Its upper end is supported by the woodwork (*k l*), and the lower by the float or platform (*n*). The woodwork (*k l*) close to the front of the dam (*c*) is lower than the dam edge, and consists of the two piles (*k*) and the supporting beam (*l*) mortised on to them. The beam is fastened to weir by strong iron clamps (*m*) (one inch square),

which go through it, and are secured by nuts or screw ends underneath. On this support (*I*) the upper end of the ladder rests free, so that its floor is level with the top of the weir and just touching it, while the sides of the ladder are higher, so that the water can flow down between them. The ends of the sides (*f f*), where they meet the ends of the guides (*v v*), are cut at angles (see illustration) to permit of the ladder working in its place, as the platform rises or falls. The small space between the ladder (*d*) and the edge of the dam (*b*) can be covered by a board nailed to the dam if it was necessary to prevent any water falling through.

‘The platform (*n*) floats on the surface of the water, and is held fast by the two bars (*s s*) which are fastened to hooks in the weir and platform. The platform is formed of several eight to nine inch logs of well-seasoned wood (*n*). These are fastened together by the stout piece (*r*), on which rests the cross-beam (*o*), the ladder being kept in place by nails in the supports (*p*), which act as axles on which it works. The end of the ladder (*e*) projects beyond the platform, and touches the surface of the pool, or dips into it a little, according to the amount of water flowing over the ladder. It will be seen that, as the water rises or falls, the platform rises or falls with it. In a small water the platform rests motionless; but in a heavy water, forming waves under the weir, it shakes.

‘The converging guards (*v v*) are for the purpose of directing the water which comes in at (*w*) *under the beam* (*z*) on to the ladder. They are about twelve inches in height, and provided with two blocks like those in the ladder (*g*) to break the force of the water, and enable the fish to get over. The object of the beam (*z*) is to control the amount of water passing into the ladder at (*w*) (the height of this opening being only about six and a half inches), and prevent too much water flowing over. In spring and summer high waters prevail in the Poprad, enabling the salmon to get over the high dam; but in autumn there is generally a low water, and the ladder is necessary in September, October, and November.

'A flood does not injure the ladder at all, but the winter's ice would tear it away ; so, as it is easily taken down, it is then taken away, and put so that the platform gets dried well by the sun. The woodwork (*k l*) is left in its place as being out of danger from ice.

'The construction of the ladder, including wood, iron, and labour, cost only 3*l*. at Kurczyn, and the cost of removal and replacing, with any necessary repairs, about 12*s*. or 14*s*. The ladder has only been used two autumns, and Herr Pietsch has often had opportunities of seeing salmon ascending it without difficulty. Before it was put up he had frequently noticed numbers of salmon collected in the pools below the dam, and making vain efforts to get over it, and at last getting caught by the fishermen. But since the ladder has been in use the salmon are rarely seen waiting in this way, as it enables them to get up at once. Models of this ladder are in possession of the Galician Fisheries Society, the Austrian Fisheries Society in Vienna, and the German Fisheries Society in Berlin, and drawings of it have been sent to England and America. As a movable and cheap salmon ladder, it seems preferable to the costly fixed affairs. With the necessary modifications required by different conditions in dams and rivers, it offers exceptional advantage, especially where expense is a consideration, and there is not much water to play with.'

Mr. R. B. Marston adds the following note : 'It seems to me that we are much indebted to Herr Pietsch for inventing, and to Dr. Nowicki for describing, such a very practical and extremely cheap salmon ladder. It can hardly fail to succeed if used on such rivers as the Don, in Aberdeenshire, at the horrible weir at Armathwaite, on the Eden, at Totnes weir, on the Dart, and other similar places where, except in heavy waters, salmon cannot pass up stream.'

Many rivers are absolutely blocked to the ascent of salmon by impossible obstacles such as those referred to by Mr. Marston, or by other barriers ; but where no such impediment exists the instinct of the fish is to go on ascending by degrees

until they gain the upper and shallower reaches, or spawning grounds. At this time all the salmon and trout species resident in fresh water, both migratory and non-migratory, acquire, in lieu of their brilliant spring tints, a dusky yellowish exterior, accompanied by a considerable increase of mucus or slime—the fins also becoming more muscular.

The usual time of salmon spawning is from November until the latter end of January or the beginning of February.¹ As the all-important operation approaches their colours undergo a still further deterioration, the general hue of the body in the males assuming a browner or more golden tinge, and the cheeks being marked with orange-coloured stripes; the lower jaw elongates, and a gristly projection or horn turns upwards from the point, which is used by the salmon as an organ of offence in its contests with other fish. In this state the males are called 'Red fish,' or are said to be 'on the reds.' The females are somewhat darker in colour, and are known by the name of 'Black fish.' The process of spawning is as follows: A pair of fish, male and female, select a gravelly shallow suitable for the purpose, which is generally occupied also by other spawners, both salmon and trout, as well as by a considerable number of male parrs.² The female deposits her eggs in shallow furrows in the gravel, to which they adhere by a thin coating of glutinous matter, the male at the same time shedding his

¹ There are, however, exceptional rivers, both earlier and later, as already pointed out; and it is probable that many of the so-called 'barren fish,' entering the fresh water in November and December, spawn in the succeeding October.

² Parr, as stated in *Proved Facts*, No. 3, are perfectly qualified to continue their species, and they perform a most important part in the reproductive process; for the attentions of the male salmon being constantly distracted by the necessity of protecting the spawning bed from the intrusion of the other fish, the ova of the female are during these absences vivified by the milt of the parrs. According to experiments by Mr. John Shaw (subsequently confirmed by those of Stormontfield), male parrs attain to the breeding state in about eighteen months, from the time of hatching. The females, it would appear, never become prolific whilst in the parr state unless they are amongst the exceptional fish alluded to in *Proved Facts*, No. 4, which remain over the third year in the rivers before migrating.

milt over them. Whether these furrows are made conjointly by both spawners, or by the female fish only, and whether the snout or the tail is the organ used in the delving process, have been disputed points amongst naturalists. From the concurrent testimony, however, of those who have had the best opportunities of observation, it now appears certain that the trenches are made by the tail of the female fish only, and that the male takes no share whatever in the more laborious parts of the domestic arrangements. The only extra-matrimonial function that he performs consists in exerting an unwearied vigilance to protect his seraglio from the invasion of rival males, all of whom he assiduously endeavours to expel—living, in fact, in a perpetual state of active hostilities.

These conflicts are incessant ; and it sometimes happens, when a rival is either very fond or very fierce, that the domestic supremacy is only to be maintained at the cost of a prolonged and desperate fight.

The weapon of attack in all these battles appears to be the cartilaginous bone or excrescence on the point of the lower jaw, which is used as a sort of battering ram, the fish, as described by Mr. Walsh, rushing on open-mouthed, and turning on his side in striking. In the case of the male fish being captured or killed, the female retires to the nearest large pool in search of a fresh mate, with whom she returns and completes the process of depositing her eggs. This she will repeat several times if her partner be removed ; and it is mentioned as a fact by Mr. Young, in his evidence before a Committee of the House of Commons, that nine male salmon in succession have thus been killed from the side of a single female, who then brought back with her, as companion, a large yellow *trout*.

In consequence, we may suppose, of the arduous nature of his military duties and reddish colour at this period, the term 'old soldier' is frequently used to designate the male salmon after spawning ; and I recently examined an old soldier in which the whole of the back and head was one mass of scars and wounds.

The female, regardless of the frequent absences of her lord during his internecine contests, and probably satisfied with the presence of the male parr, proceeds quietly with her operations by throwing herself at intervals of a few minutes, upon her side, and whilst in this position, by a rapid action of the tail, she digs a receptacle for her eggs, a portion of which she on each occasion deposits, and, again turning on her side, covers it up by a renewed action of the tail—thus alternately digging, depositing, and covering over, until the whole are laid.

The adult fish after spawning are called 'spent' or unclean fish, or 'kelts;' and at this time they are quite unfit for food—indeed almost poisonous—and their capture is prohibited by law. Lately spawned kelts may be recognised by their dark unhealthy colour, lanky flaccid appearance, and by the enlargement of the vent. Their gills also are almost invariably found to be infested by a species of white worm, the *Lernæa salmonis* of Linnæus, often improperly called a maggot, from which they are released by contact with the salt water—a similar release from other parasites being obtained on passing to the fresh water from the sea.

For some time after spawning, however, they are in a very weak and exhausted state, and have not energy for immediately descending the river. Accordingly they usually drop down from the spawning grounds, or 'redds,' to the first quiet deep, there remaining until their strength is recruited. They then continue falling back with the winter and spring floods, descending from pool to pool, and avoiding as much as possible weirs and rapid currents, until they reach the sea. Here they quickly recover their condition, to ascend the rivers again (in at least many cases) in the autumn or succeeding spring for the same purpose as before, but almost always remaining some time in the brackish water or tideway before making either decided change.

Within a period of five or six months after their return from the salt water, it has been proved that at least a proportion of

kelts find their way back to the upper reaches of the river as clean fish, having gained in weight during the time from seven to ten pounds.

The annexed table shows the actual increase of weight in three fish marked by the Duke of Athol when returning to the sea as kelts :

<i>Caught as kelts or spawned fish returning to the sea.</i>			<i>Retaken ascending the river as clean fish.</i>		
No.	Date	Weight	No.	Date	Weight
No. 21—	Feb. 14	10 lbs.	No. 21—	Aug. 18	17 lbs.
No. 75—	Mar. 2	11½ lbs.	No. 76—	Aug. 18	17 lbs.
No. 95—	Mar. 29	12½ lbs.	No. 95—	Aug. 12	19 lbs.

Whilst descending to the sea in the spring months kelts are a great annoyance to anglers, as at this time they are ravenous for food, rising greedily at any sort of fly, and though not so strong and obstinate as clean fish, often taking up more time in landing than can conveniently be spared.

That spawned fish improve greatly before they leave the fresh water there is no room to doubt (although they are never really in prime condition for the table until their return from their sea trip), and hence the expression, ‘A well-mended kelt ;’ which is common amongst fishermen. These kelts are often almost as bright and silvery looking as the really clean fish, and are not unfrequently sold as such in the towns ; but the head is disproportionately large, owing to the body not being filled up, and upon opening the gill covers, the white worm, before mentioned, will almost invariably be found adhering.

The hatching of the eggs and the growth of the young fry is the next great event in salmon life, and leaving, therefore, the exhausted and more or less ill-conditioned kelts to recruit themselves in their salt-water bath, we return to the spawning bed where the eggs are approaching the time of hatching. Into this bed, during the preceding three months, a dozen females have each poured the germs of, say, from seventeen to twenty thousand salmon, which, if they all arrived at maturity, would represent in approximate figures some three million five hundred thousand pounds weight of wholesome food, or a

money value of about 160,000*l.* Unfortunately, however, the fry actually added to the stock of the river are a mere fraction, and those that survive to return as grilse a very trifling fraction of these numbers. The proportion has been calculated by some authorities as about one in every thousand, and by others at a maximum of one in every *six thousand*, out of the original deposit of ova.

Great as this loss appears to be, it is not really to be wondered at when the numberless causes of destruction are borne in mind. From the first laying of the egg until the plunge of the young smolt into the tidal wave, and even afterwards in the broader waters of the estuary or open sea, a hundred wholesale depredators lie in wait for it.

First there are the shoals of hungry fish of all kinds which prowl about the fords, pressing close behind the spawner, and ready to fight for the possession of her eggs almost before they are laid ;¹ then come the voracious larvæ of the may fly and stone fly, the water shrimps, and a host of kindred insects, which work their way in amongst the gravel and destroy, perhaps less ostentatiously, but not less certainly ; whilst a winter flood will often sweep down the river, and bury a whole brood under a foot of sand drift. If the egg escapes these perils, and, in due course, releases its charge, fresh dangers await the delicate and immature fry. The trout, the heron,² and the wild duck—even the parent salmon themselves—hunt it out in its sheltering creeks and crevices ; and hundreds of fry are daily sacrificed on a single spawning bed by this means. Lastly, as if these causes of destruction were insufficient, naturalists have discovered that there is in some waters a species of plant by no means very uncommon, the Bladderwort (*Utricularia*),

¹ When a keeper of the Thames Angling Society was employed in procuring trout ova in a stream at High Wycombe, he observed a pair of trout spawning on a shallow ford, and another just below them devouring the ova as fast as they were deposited by the spawner. The keeper netted the thief, and in his stomach were found upwards of 2 oz. of solid ova, or about 300 eggs.

² One of these long-legged poachers was caught *in flagrante delicto*, at the Stormontfield ponds. When shot he vomited up *more than fifty fry*.

which *eats fish* ! It does not appear to have been clearly proved that this piscivorous plant is usually, or indeed often, in the habit of eating young salmon, and happily its natural proclivities seem to favour stagnant rather than running waters ; but as regards the minute fry of other species it has been undoubtedly caught *in flagrante delicto*, with the victims in its stomach, or rather bladder, and therefore it would be rash to assume that its depredations are confined to the fry of the coarser kinds of fish. At any rate the notion of an English fish-eating plant is so novel that I shall probably be pardoned if I take the liberty of here quoting a very interesting account of it which appeared in the 'Pall Mall Gazette' from the pen of Mr. Grant Allen :

Our common bladderwort is a small floating water weed, found here and there over all parts of England in still pools and stagnant backwaters, and its long and slender root-like branches hang on the surface of its favourite ditches in thick masses of tangled vegetation. It seldom exceeds a foot in length, and has no height at all to speak of, the branches all dispersing themselves radially through the water on every side ; while the flower stems, which alone rise above the surface with their graceful little cluster of snapdragon-like yellow blossoms, hardly attain a greater height than six or eight inches. The tiny leaves, like those of almost all water plants, are very fine and almost hair-like ; but interspersed among them on the branches every here and there are a number of curious small green vesicles or bladders, which give the plant both its common English name of bladderwort and its scientific synonym, *Utricularia*. These bladders, though submerged, were held to be full of air ; and it was long supposed that their only office was to aid in keeping the plant afloat—a belief all the more reasonable because many aquatic plants actually have such air receptacles on their leaves or leaf stalks for that very purpose, as in some familiar seaweeds, and in that curious floating pond plant, the water caltrop of Southern Europe.

The bladders of the bladderwort, however, differ from these mere floats or swim-bladders of other water plants in the strange peculiarity that they have each a door, closed by a valve which opens inwards only. The whole mechanism, in fact, may be roughly compared to an eel buck or a lobster pot, or even better,

to one of those mouse traps in which a small door closes behind the unsuspecting mouse as soon as he has entered. Mrs. Treat, of New Jersey, first showed that these bladders were really insectivorous or carnivorous organs ; and Mr. Darwin afterwards worked out the subject in minute detail, recording the results of his observations in his charming volume on *Insectivorous Plants*. He showed that small floating animals, such as fresh-water shrimps or the larvæ of gnats, get entangled in the bladders, and there die, their decomposing bodies afterwards serving as food for the tissues of the plant. So far as he could discover, no true secretion of the nature of a gastric juice takes place inside the bladders, and so there is no true digestion, as in some of the higher and more perfect insect-eating plants, such as the sundew ; but the wall of the bladder is covered by small glands, and by prickly hairs—‘a serried mass of processes,’ as Darwin well calls them, which absorb directly the protoplasm or valuable organic matter of the included prey into the tissues of the hungry bladderwort. Darwin believed that the fresh-water shrimps and other creatures on which the bladderwort feeds merely entered the door of the bladder out of pure curiosity, so to speak, without the plant making any definite quasi-voluntary efforts to entice or entrap them ; but Mrs. Treat’s more recent investigations seem rather to show that the tiny vegetable traps actually open their mouths automatically, and snap up the unwary prey whenever it approaches too near the small green and almost invisible jaws. It should be added that the statement recently made in several newspapers as to the bladders being ‘the size of a pear’ is an obvious mistake. If *Utricularia* were a carnivorous plant on such a gigantic scale as that, it would prove a very parlous fish eater indeed, and be hunted down by salmon preservers like otters and herons. The real size of the bladders is scarcely that of a garden poppy seed.

At this stage our knowledge of the habits and manners of the bladderwort rested until the spring of the past year. The plant was known to catch small insects and fresh-water crustaceans in its tiny traps, and to use up their bodies as manure for its own development ; but it was not yet known to be distinctly piscivorous. Last May, however, Mr. G. E. Simms of Oxford, brought Professor Moseley a specimen of *Utricularia* in a glass bowl, in which were numbers of young roach, just hatched out of a mass of spawn lying at the bottom. Many of the small fry were seen dead, held fast in the firm bladder jaws of the murderous plant. Professor Moseley, being

interested in this curious discovery of a fish-eating weed, secured another specimen of *Utricularia*, and put it into a separate vessel, with fresh spawn and young fry of roach. In about six hours more than a dozen of the fish were found caught in the wee green gins. In most cases the fish are caught by the head ; and when this is so, the snout is pushed into the bladder as far as it will go, till it touches the opposite wall, leaving the tail of the poor struggling thing half free outside. Sometimes, however, the bladders catch the young roach by the tail, a fact which seems to prove the truth of Mrs. Treat's view that the valve actually snaps at the prey, instead of merely allowing it to enter passively. In one of Professor Moseley's specimens, a fish was caught by the yolk bag, which fry carry in their early stage attached to the stomach ; and in another instance two bladders had got hold of the same fish, one trapping him by the head and the other by the tail.

Seen under the microscope the semi-transparent green traps, with the tiny silvery bodies of the dead fish half protruding from them, form very striking and beautiful objects. The big black eyes of the fish show out clearly by transmitted light through the green wall of the cell that has caught them. Preserved in spirits, the specimens are less interesting, because then the bladder loses its green colour, and the force of the contrast is considerably weakened. After the fish have been for some time trapped they assume a slimy deliquescent appearance, and are rapidly absorbed by the glandular processes. As these processes project obliquely backward, Professor Moseley thinks it probable that they help to catch the fish and prevent him from escaping, in somewhat the same manner as the barbs of a hook or arrow, or as the backward-pointing twigs of an eel buck would do. Each fresh struggle and plunge must make the fish get deeper and deeper entangled in the trap, because the processes, catching in his gills or gill slits, prevent him from moving backward and compel him to move forward only. *Vestigia nulla retrorsum.*

One word as to the evolutionary history of this singular water weed. It is a close relation of the beautiful pale-green butterwort, whose graceful purple-blue blossoms are found on almost every upland bog or hilly brookside along the whole western half of our islands. Butterwort is itself an insectivorous plant, as are all its congeners ; and *Utricularia* is only a butterwort which has taken to living in water, and has so far adapted itself to its new conditions as to eat fish as well as insects. By descent, the butterworts

are probably members of the primrose family, specialised for inhabiting marshy spots ; while the *Utricularia* is a butterwort which has further adapted itself to a wholly aquatic life.

I hope all fishers who may come across the Bladderwort will not fail to make a careful examination of the contents of the 'larder,' and if any young salmon or trout are found in it communicate instantly with the police, or rather with the nearest water bailiff.

We left the young salmon, or parr, just prior to its emerging from the egg, and still all-unconscious of the dangers to come, and the perils besetting its progress to adolescence.

With the various enemies above mentioned besetting every period of their existence—to say nothing of the great biped parr destroyer, man himself—it ceases to be a matter of surprise that the percentage of fry attaining the grilse stage should be as small as it is ; the only wonder is that it is not still more trifling.

By the system of artificial hatching and rearing, however, now successfully carried out in different parts of the country, the loss of ova, and of fry in its earlier stages is reduced to a minimum. But this subject is fully dealt with elsewhere.

Let us revert to the spawning beds, where the ova have now been deposited and covered carefully up under little mounds of fine gravel.

The first sign of animation in the egg is the appearance of the eye, which may be noticed, a scarcely perceptible black speck, in from forty to sixty days after deposition. The eye gradually increases in size until the time of hatching—an event which usually occurs in from 90 to 140 days, according to the temperature of the water and forwardness of the spring. This period is liable, however, to great variations. The usual time in Scotland is from 100 or 110 to 140 days. South of the Tweed it is often considerably less. In water of the constant temperature of forty-four degrees, eggs have been hatched in sixty days ; whilst in some experiments made at the Crystal

Palace in 1859, several were actually matured, it is stated, in as little as thirty days.

The actual bursting of the young salmon from the egg, which I have often watched, takes place thus: The fish lies in the shell coiled round in the form of a hoop; and the greatest strain being at the back, it is at this point that the shell splits across. After a few struggles, it is completely thrown off with a jerk—leaving the red yolk of the egg, by which the fish is nourished during the first five or six weeks of its existence, suspended in a conical bag under the stomach. At this 'bag stage' of its development the future monarch of the stream is represented by a mere ragged line, fringed at the edges and almost transparent, the head and eyes being prominent and altogether out of proportion to the body, which measures only about five-eighths of an inch in length, and is of a pale peach-blossom or azure tint. In thirty-five or forty days after hatching the yolk bag disappears, and the fry becomes a perfect little fish of about an inch long with the fins separated and properly developed, and the tail deeply forked at the end. The general colour now also changes to a light brown; and the sides are indistinctly crossed by nine or ten transverse dusky bars, or parr marks, characteristic of all the species of salmon and trout when in an immature state, and which in the true salmon remain more or less visible even in a smolt or parr six inches long.

The differences in appearance between the fry of the salmon, bull trout and sea trout, and probably also between the fry of the other allied species of the genus, are so trifling as to be scarcely perceptible, and are, moreover, liable to variations with local circumstances.

The young salmon fry are unable to move about very freely, owing to the presence of the vitelline, or yolk bag, which impedes their motions in swimming, and obliges them when at rest to lie perpetually on their backs, unless artificially supported. This support they seek to obtain by placing themselves amongst gravel or in crevices between stones, exhibiting generally

a great desire to escape observation—an instinct given to them, no doubt, for their preservation during so feeble and helpless a condition. On the disappearance, however, of the yolk bag and assumption of the parr marks, they come from their hiding places, and are to be found, on careful search, in the streams in or near which the parent salmon deposited their spawn during the preceding winter.

At two months old the parr begins to acquire a more symmetrical form, and the disproportion in the size of the head ceases to be observable; at four months the characteristic parr marks are clearly defined; and at six months the fry has reached the length of three or four inches, and is the small-sized parr so constantly found in salmon rivers.

The next change is that of the parr into the smolt, preparatory to the first migration to the sea.

In somewhat more than twelve months from the time of hatching, that is, between the middle of April and the early part of June—about half of the last year's parr begin to assume their bathing dress or coating of silver scales as contrasted with the yellower scales worn up to this period. These silvery scales, which form the distinctive mark of the smolt, as distinguished from the parr, are never put on except when the fish is about to migrate; and without them it will not migrate at all, and cannot exist in salt water, as has been proved by experiment. These scales come off upon slight pressure and the parr marks are visible below.

At this time the habits of the transforming fish undergo a marked alteration. As parr they show no disposition to congregate, each occupying its own place in the pond, and any intruder upon a post already tenanted being instantly and forcibly expelled; but as soon as the whole brood have donned their travelling costume—an operation usually lasting two or three weeks—they collect in a shoal, and show their desire to escape by scouring about hither and thither, leaping and sporting, and generally displaying a greatly increased amount of energy and activity.

One half of the young fry migrate when about a year old—almost all the other half at their second year—and the few remaining at their third year—but the period of the descent is very generally the same in either case—and in all rivers, whether early or late—beginning in March and continuing through April, May, and the early part of June—only a few fish continuing to migrate during the subsequent months.

The length of the smolt when migrating varies from three and a half to seven or eight inches, according to age and other circumstances.

Its full colours are, dark blue or bluish green on the upper half of the body and head, with black or carmine coloured spots; gill covers and lower half of the body silvery, and all the fins much darker than those of the parr. The silver scales come off on slight pressure and the parr marks are visible below. What becomes of the young fish after reaching the sea is still, more or less, a matter of conjecture. What we do know positively is, that in from six to eight weeks a number return to the same river with an increase in weight of from two to five pounds, and that many of the fry marked when migrating as smolts in May and June, are sold in the London markets as grilse in July, August, and September. It is a fair point for conjecture, and would be an interesting subject for future experiment, whether the grilse returning the same season may not consist principally of the *two-year-old* smolts, and so on; or whether, should this prove not to be the case, these older smolts may not represent the larger-sized grilse, and the younger fish the smaller ones.

The following is the actual growth of some smolts marked at Stormontfield, when on their way to the sea, and captured on their return as grilse during the same year :

	Weight		Weight
July 1 . . .	3 lbs.	July 31 . . .	9½ lbs.
July 20 . . .	5½ lbs.	Aug. 4 . . .	7½ lbs.
July 21 . . .	5 lbs.	Aug. 4 . . .	8 lbs.
July 30 . . .	7½ lbs.		

Of the habits and food of the salmon in its various stages

whilst in the sea we know little. In his evidence before the Select Committee of the House of Lords in 1860, Professor Quekett stated it as his opinion that salmon travel some distance along the coasts, and probably into deep water, in search of the ova of the echinus or sea urchin—a species commonly inhabiting a depth of not less than from six to twenty fathoms. Professor Huxley disagreed with this view as regards the nature of the food, and believed that it consisted chiefly of a numerous class of small creatures—entomostracous crustacea—found in semi-solid masses upon the surface frequently of deep water—in fact, that the salmon swims in a species of animal soup, in which it has merely to open its mouth and swallow what enters it. Dr. Knox was of opinion that the food consisted of the ova of various kinds of star fish, sea urchins, encrinites, &c., and some of the crab and lobster family, whilst Dr. Fleming and several other naturalists have observed upon the partiality of salmon for the sand eel or sand launce—a fact which is confirmed by Sir John Richardson, who states that he has himself taken this fish from their stomach. Herrings and many other kinds of fish are also probably laid under contribution.

But whatever be its food, judging from the perfect arrangement of the teeth and the tremendous rate at which it increases in bulk, there can be no doubt that the salmon is a most voracious feeder—although the very small amount of food usually found in the stomach has hitherto been a source of difficulty in ascertaining its exact nature. The singularity of this latter circumstance has often been discussed by writers on ichthyology, and it has been suggested, amongst other less probable explanations, that the gastric juice of the fish was so powerful as to dissolve almost instantaneously whatever was subjected to its action—another, and I am inclined to think, more correct hypothesis being that the fish ejects its food on finding itself hooked or netted.

On this subject a writer in 'Once a Week' furnishes evidence which seems to be practically conclusive: 'My friend, Mr. Walter Campbell,' he says, 'informed me that he once had

a wonderful haul of salmon at Islay. . . . He landed 716, and many of them escaped. As the net approached the shore *he saw the fish discharging the contents of their stomachs*, which consisted of small eels.'

As regards the travelling or otherwise of the salmon in the sea, the thousands of salmon constantly taken in nets along all parts of our coasts are a clear proof that they do travel, at least to considerable distances, from their native rivers and estuaries ; and from the observations of Sir William Jardine and Dr. Heysham it would appear probable that, when the fish happen to have thus wandered beyond their usual limits, they will at the proper season run up the first stream they meet with, the temperature and condition of which are congenial.

The more usual course of events, however, is for the salmon to return to their own rivers or localities, most remarkable and well-authenticated proofs of which are on record and could be produced in abundance.

It is only in the salt water that the salmon species, generally speaking, gain in weight after once quitting the smolt stage. During their sojourn in the sea after the first spawning, the growth of the grilse is exceedingly rapid, a considerable portion at least of such fish returning to the river in the summer and autumn with an increase in weight of from five to nine pounds. In twelve grilse of four pounds each which were carefully marked by Mr. Young when descending to the salt water, this was found to be the average increase on their return during the same season. Whether the growth rate is as rapid in the later stages of salmon existence we have no equally accurate means of judging ; but reasoning from analogy it would appear probable that it decreases somewhat with the advancing age of the fish, and in very old specimens is perhaps comparatively trifling. Of such patriarchal salmon, the largest recorded to have been captured in British waters was a female fish of the weight of eighty-three pounds, which was exposed for sale in the shop of a London tradesman in the year 1821. Another of seventy-four pounds is alluded to by Pennant ; Salter, in one of his works

on angling, refers to the capture of a salmon of seventy pounds in the Thames near Fulham, in the year 1789, 'which was subsequently sold to Mr. Howell, a fishmonger in the Minories, for a shilling a pound,' and during the present season, when fishing for ova on the Tay at Almond Mouth, a fish was netted considered to have *weighed over eighty pounds*, as it was six and a half inches longer than one of seventy pounds taken in the same river, of which there is a cast in the South Kensington Museum. It was a male fish in splendid condition, and measuring in length four feet eleven and a half inches, and in girth two feet five inches. As it was the close season the fish was, of course, returned to the water, and, as Mr. Malloch, who reports these particulars, observes, some one may get him with the fly later on. Whoever does will have his work cut out !

Very large salmon are, however, occasionally caught with the rod. One is noticed by Mr. Lascelles, as taken in Scotland, which weighed fifty-four pounds and a half. The late Sir Hyde Parker captured one in Sweden weighing sixty pounds, and a former Earl of Home took another from the same waters of the unequalled weight of seventy pounds within a few ounces.

I have never myself been lucky enough to kill a salmon over twenty-five pounds, but I have had my 'experiences' with fish which I know both from sight and 'feel' must have been nearer forty-five than thirty-five pounds.

I once had one on in the Usk from two o'clock till eight in the evening—for a good part of the time right under the point of my rod, a sufficiently powerful one, but could do absolutely nothing with him. When he liked to move to another pool he moved there, and when he liked not to move at all he stopped still. At last it began to get dark, and lanterns were brought from the village and dotted at short intervals up and down the river which was now coming down in a heavy spate. At last, at about eight o'clock, when the flood was 'roaring from bank to brae,' he made one splendid rush under Kamscatlog bridge, where to follow was impossible—carried out the whole of the eighty or ninety yards of line, and rolled over the fall below, as

the keeper, who had been set to watch, said, 'like a great porpoise.'

'Will salmon live and thrive entirely in fresh water—that is, in lakes and ponds which have no communication with the sea?'

Much controversy and many experiments have been devoted to this question. The answer appears to be in the negative, as far as all practical purposes are concerned. It has been proved that the fish will so far increase under these conditions as to attain a maximum weight of a few pounds; but the flesh of such fish is comparatively white and insipid, and as an article of food altogether different from that of the sea-bred salmon.

This, however, may be an unduly gloomy view of the subject, and I shall be very pleased to find my anticipations in this respect falsified. Experiments tried some years ago in Norway certainly seemed to point to at least a qualified success having been in some instances attained. The account which was written for the '*Fisherman's Magazine and Review*,' at the time when I edited that magazine, may, perhaps, be sufficiently interesting to quote.

'It can,' says Mr. Barnard, 'readily be understood that in a country so unfertile as Norway, where, in fact, little more than the hundred-and-fifteenth part of its whole superficial area is under cultivation, any attempt to propagate such fish as salmon in the interior must in an economical point of view be extremely valuable. And, perhaps, no country is better adapted for the carrying out of such experiments than this portion of the Scandinavian Peninsula, which abounds with lakes and mountain tarns of all sizes, and at all elevations.'

'And first, as regards sea trout, their endeavours have been attended with most satisfactory results. Not only have they thriven well in the lakes in which they were turned out, but have rapidly increased in numbers. And just as river trout after having been any length of time in brackish water become thoroughly acclimatised, and in fact resemble sea trout in all respects, so has it reciprocally been the case with the sea trout in question in fresh water.'

‘ One of the first attempts that were made with salmon was in 1857. A quantity of salmon fry were in that year put into a small fresh-water pond in Lier, in the South of Norway. Their growth was found to be very slow ; for, in the summer of 1862, when they were, therefore, five years old, they had only attained a weight of about one pound and three-quarters.

‘ There can be but little question, as will subsequently be seen, that the small size of the pond, and the consequent deficiency of food, had much to do with their tardy development ; for when other fry were turned into larger waters, much more satisfactory results were obtained. In these latter instances not only did the fish attain a quicker and larger growth, but the flavour of their flesh was vastly superior. Therefore, I think, we may infer that it was the want of the proper food, and not so much of the salt water, that was the cause of their slow growth in the small pond.

‘ Again, in Laurdal, in Lurnig’s Fogdin, in Lower Thelemackey, there are two lakes named, I think, Siljevande. Before 1856 there were only carp &c. in them. But in that year two thousand salmon and sea-trout fry were turned in. At this time these lakes abound with fish, as the salmon and sea trout have rapidly propagated. In the summers of 1860, 1861, and 1862, fish of all sizes have been seen to leap in them ; but none were taken till last summer, when several were caught on flies. Some of the salmon were found to weigh from three and a half to five pounds ; while the sea trout had attained about half that weight. The flesh in both of them was pink, and was extremely well-flavoured.

‘ Another successful attempt to acclimatise these fish was made on a property named Sorkøe, in Stören, some distance to the south of Thronhjelm. The owner of the above and his brother turned out several salmon and sea-trout fry into two lakes on the estate, which were previously entirely destitute, I believe, of fish of any sort. Now they teem with them, and salmon have been caught in them from two and a quarter to nearly seven pounds weight.

‘In Holsfjard, in Ringerike, not far from Christiania, a lake larger, I believe, than any of our Scotch or Irish lochs, several thousand salmon fry has been turned in, which now have attained weights varying from three to nine pounds.

‘And, now, what deductions may we at home draw from the above interesting facts? Why, not only that sea trout and salmon will grow in fresh water, but that they will also breed there without migrating to the sea. That their development is more tardy than of those which have access to salt water is only what might be expected.

‘It seems further that the larger the lake the speedier their growth. And this undoubtedly seems to corroborate the opinion that the salt water is not absolutely essential to their development; but that they grow quicker when they have access to it, chiefly because they have a more varied and abundant supply of food. And if one further takes into consideration that salmon are as much fresh-water as sea-water fish (for their stay in the former is quite as long and in some instances longer than in the latter); and that they have also so much in common with river trout and charr, it will be allowed, I think, that these experiments in Norway may open a wide field for practical investigation with us.

‘Another fact worthy of notice is that it was with the young fry, and not with ova that the experiments were made.

‘Whether the salmon after a lapse of time will like sea trout adopt the form, colour, and flavour of fresh-water trout, experience only can decide.

‘It seems too that while the experiments in small ponds have been partial failures (though even in this case it has been shown that they will breed in them), those that have been made in waters of large dimensions have quite realised all reasonable expectations.

‘The Nirösen lake, which ranks next in size to the Wenern and Wettern, is, I hear, to be experimented on on a large scale. I trust the trial will meet with the success it deserves.’

From the above facts I see no reason to doubt the success of making the experiment of turning out salmon and sea-trout fry into our Scotch and Irish lochs, and into our Cumberland lakes. At all events it would be interesting to make the trial. Patience and perseverance can work wonders.

The principal characteristics of the true salmon are :

Length of head compared with whole length of fish as 1 to 5. Body elongated; dorsal and abdominal line about equally convex. Lateral line near middle of body, dividing it about equally. Fleshy portion of tail slender. Scales, moderate sized, oval, and thin, easily removed when young, adherent when old. Teeth, stout, pointed, and curved, one line on each side of upper jaw, one line on each bone of palate, one line on vomer or central bone in roof of mouth when quite young (loses a large portion on first visit to salt water, and gradually all, or all but one or two on most forward point of bone), on line one each side of lower jaw, one line on each side of tongue (occasionally two lines on each side of tongue).

Fin rays : D. 13: P. 12: V. 9: A. 9: C. 19. Vertebrae, 60.

THE BULL TROUT (*Salmo eriox*).

Although differing in many respects from the true salmon, and constituting, of course, a distinct species, yet in many of its habits, if not, indeed, in all, the bull trout bears so close a resemblance to the latter fish that the history of the one may, to a great extent, be taken as the history of the other, and all the laws relating to salmon apply equally to the bull trout and their young, under whatever local names they may be known.

Like the salmon, the bull trout ascends rivers for the purpose of spawning, deposits its ova on similar spawning grounds, and after the process returns to the sea to restore its exhausted energies and increase in weight and bulk. So far as I am aware nobody has actually verified—that is by the same absolute means as in the case of the salmon—the periodical growth-rate of the bull trout between its various migrations. But as I have caught several hundreds of bull trout myself in the Usk averaging from four up to twenty pounds and never remember to have caught one of much less than the first-named weight, it is only reasonable to conclude that this is the size at which they

return to this river after their first salt-water trip—in other words, that it represents what would be the grilse stage in the true salmon.¹

One reason why the natural history of the bull trout is not so well understood as that of the salmon is doubtless its comparative rarity ; another is its inferiority both for the market and as a 'sporting fish.' Indeed, Lord Home, who writes with unequalled authority as regards the *Salmonidæ* of the Tweed, has put it on record that in his opinion 'a clean bull trout, in good condition, is scarcely ever known to take fly or bait of any description, and it is the same in the Esk at Dalkeith.' Lord Home continues : 'I believe I have killed as many—indeed, I may venture to say, I have killed more salmon with the rod than any one man ever did, and yet put them all together, I am sure I have not killed twenty clean bull trout. Of bull trout kelts thousands may be killed.'

I have been so far more lucky than Lord Home, having caught clean bull trout in good condition, and, indeed, with the marks of the tide lice still on them, not once, but, I may say, scores of times. They will not, however, in my experience, rise to the fly or take the minnow with any degree of readiness, and the bait with which I have had my success has always been a lobworm, used as described under the head of worm fishing for salmon.

The more common weight of the bull trout is under fifteen pounds, but it is sometimes taken weighing as much as twenty or even twenty-five pounds. When a clean fish of this size happens to be hooked it makes a splendid fight, dashing itself repeatedly into the air and yielding to its fate only after an exhaustive conflict, in which it is aided by the size and great muscular development of the fins, which are larger than those of the salmon.

Indeed, although, as observed, in a double point of view

¹ This average is larger than that of the bull-trout grilse in the Tweed, which are said to weigh from 2 to 4 or 5 lbs. Most probably, however, different rivers differ somewhat in this particular,

inferior to both the salmon and sea trout, if we can only induce him to try conclusions with us the bull trout is a splendid fellow—a ‘foeman worthy of our steel.’ There is a breadth of build and general strengthiness about him which is not belied by the gallantry and determination with which he shows fight when brought to bay. I think he dies harder than even the salmon—the Bayard of the water, *sans peur et sans reproche*. Indeed, he is better built for fighting in some respects, being shorter, thicker, and generally more muscular—more bull-like, in fact, in appearance, as his name denotes

I have pointed out the comparative rarity of the bull trout as contrasted with the salmon proper, but it is very likely that it exists in many more rivers than those chronicled by ichthyologists, and indeed that it is in many cases mistaken by local anglers for the salmon. The river in which it is best known and where its habits have been probably most studied is the Tweed, where it is as abundant as either the salmon or sea trout. Lord Home gives the following observations on the habits of the Tweed bull trout :

‘The bull trout has increased in numbers in the Tweed prodigiously within the last forty years, and to that increase I attribute the decrease of salmon trout or whitling—for the whitling in the Tweed was the salmon trout, not the young bull trout, which now go by the name of trouts simply. The bull trout take the river at two seasons. The first shoal come up about the end of April and May. They are then small, weighing from two to four or five pounds. The second, and by far the more numerous shoal, come late in November. They then come up in thousands, and are not only in fine condition, but of a much larger size, weighing from six to twenty pounds. The bull trout is an inferior fish, and is exactly what is called, at Dalkeith and Edinburgh, Musselburg trout.

‘The great shoal of bull trout not taking the river till after the commencement of close time, are in a great measure lost both to the proprietor and the public.’

Yarrell, however, speaking of the bull trout generally,

appears to differ from this view, as it is evident that if the fish do not run up the rivers till November, they spawn *later* than the salmon ; whereas Yarrell asserts on the contrary that 'they ascend rivers for the purpose of spawning, in the same manner as the salmon, *but earlier in the season* ; and the fry are believed to go down to the sea sooner than the fry of the salmon.' This discrepancy is possibly to be explained by the different habits of fish of different waters.

Amongst the localities in which the bull trout is known to exist may be mentioned some of the streams of Devonshire and Cornwall, the Severn, the Usk, and several of the rivers of South Wales (where it is called the Sewin), and according to Dr. Heysham, in some of the Cumberland waters debouching into the Solway Frith. In Ireland it occurs very generally on either side of the northern portion of the island ; and Killala Bay, Donaghadee, Florence Court, Beleek, Crawfordsburn, Nanny Water, Ballyhalbert, and Dundrum are all referred to by Thompson as places whence he had obtained specimens. Sir William Jardine mentions the bull trout as being found in the Annan, Dumfriesshire ; and Mr. Low recognised it as an inhabitant of the Loch of Stenness, Orkney. The Liddel, which runs through Roxburghshire, appears to have been once renowned for this fish. Sir Walter Scott, in his notes to the 'Lay of the Last Minstrel,' quotes an old rhyme celebrating the places in Liddesdale remarkable for game :

Billhope braes for bucks and racs,
And Carit haugh for swine ;
And Tarras for the good Bull Trout,
If he be ta'en in time.

'The bucks and roes, as well as the old swine, are now extinct, but the good bull trout is still famous.'

It has been asserted that the trout of the celebrated Coquet, commonly spoken of as 'Coquet trout,' are, in fact, the bull trout, but the 'Kelso Mail' criticises the assertion as being wholly inaccurate. 'The Coquet trout,' says the writer of the article,

'is the common yellow fin, or *Salmo fario*, and the bull trout are the salmon of the river. There are no true salmon, *Salmo salar*, in Coquet, the only sea fish frequenting the river being bull trout; but with Coquet-side fishermen the terms salmon and bull trout are synonymous: hence "salmon" with them means *Salmo eroix*, or bull trout, and "trout" *Salmo fario*, or common river trout.'

Principal Characteristics of the Bull-Trout.—Length of head compared to body only, as 1 to 4; general form of body similar to that of the salmon, but nape of neck and shoulders thicker, and fleshy portion of tail and base of each of the fins more muscular. Teeth of female smaller than those of male. Elongation of lower jaw confined to the males only, but not so conspicuous as in the salmon. Scales rather smaller and more numerous than those of a salmon of equal size. Colour: when in good condition, like that of the salmon trout; at spawning time, (in the *males*) head olive-brown, body reddish or orange brown; (in the *females*) blackish grey; in both fish the back fins reddish brown, spotted with darker brown, tail fins dark brown, the other fins dusky brown. Vertebrae commonly 59, occasionally 60.

Fin rays: D. 11: P. 14: V. 9: A. 11: C. 19.

The following were the principal dimensions of a very handsome specimen which I had sent up to me from the Tweed: Total length, tail fin included, two feet four and a half inches, girth at shoulder, just behind head, fourteen and a half inches, weight eight and a half pounds.

THE SEA TROUT OR SALMON TROUT

(*Salmo trutta*).

Passing now to the last of our silver or migratory group, we come to the sea trout, or as it is sometimes called salmon trout, *Salmo trutta*, a fish much more frequently met with than the preceding species and as a food fish ranking 'with, but after' the salmon, with which, also, owing to the general similarity of its habits, it is included in all statutory restrictions.

Under a separate heading in this article the marks by which the sea trout can be most readily distinguished from the salmon and bull trout are given in detail, and beyond this it need only be observed generally that in appearance it is

somewhat rounder or more tapering than either of its congeners, the form of the gill lids and proportions of the tail being intermediate between the two. The scales are also relatively smaller.

Indigenous in almost all salmon or bull-trout rivers, and frequently abounding in streams which produce neither the one nor the other, there is no fish that swims which, when in the taking mood, will rise so boldly at the fly, or make a pluckier or more brilliant fight.

In the division which I have adopted between the white or migratory species of trout and the yellow or non-migratory species, the sea trout is the only one about which any difficulty of identification is likely to arise. The difference in colour between the *fario* and the *trutta*—the one being silver and the other golden or yellow—is usually too obvious to admit of doubt; but, especially when confined for a long time in a lake or loch, sometimes the sea trout gets bronzed and acquires a colour not very unlike that of the common trout. If a doubt as to the species should thus arise a reference to the *teeth on the vomer or central bone on the roof of the mouth* will decide the point. These teeth in the common trout—as also in the great lake trout—run in *two* distinct rows, whilst in the sea trout they run only in a *single* row. It is to be observed, however, that teeth require to be closely examined, as in the case of the sea trout the points bend alternately to either side, so as to present rather the appearance of a thinly planted double row; whilst in the common trout the two lines of teeth are placed so that a *space* in one row has a *tooth* opposite it in the other, making the difference appear at first sight to be little more than one of comparative closeness in the setting of the teeth.

In regard to the position of these vomerine teeth, the engraving of the mouth of the common trout, given farther on in this article, is somewhat inaccurate, resembling, in fact, more nearly the appearance of the single row seen in the mouth of the sea trout.

The usual weight of the sea trout runs from one to three or

four pounds, but larger specimens are constantly met with; one, for example, a male, was taken in July 1840, at Sanstill fishery, on the Tweed, thirty-seven inches in length, twenty-two inches in girth, and which weighed twenty-four and a half pounds, and in November 1846, one of forty inches in length, weighing twenty-one and a half pounds, was caught in the Tawe, near Drayton Manor, and presented by Sir Robert Peel to Professor Owen.

Scotland produces the sea trout in great abundance, and throughout almost the whole of Ireland it is widely distributed. In Wales also it is frequently met with, as well as in some of the Devonshire streams and in those of Cumberland and Cornwall. On the banks of the rivers falling into the Solway Frith the sea trout is called, in its grilse state, a hirling,¹ and in Wales and Ireland it commonly goes under the name of white trout. It is believed to be the 'Fordwich trout' of Izaak Walton, so named from a village on the Stour, near Canterbury, where it still maintains its reputation for being 'rare good meat'—according, at least, to the reports of those who have tasted it from the Ramsgate market. M'Culloch mentions that it is found in a fresh-water lake in Lesinore, one of the Hebrides, where it has existed for many years, precluded from ever visiting the sea, but apparently quite reconciled to its prison, and breeding freely.

If it could be really introduced and found to thrive and propagate in closed pools or lochs, what a splendid addition the *Salmo trutta* would be to our lake fish.

Principal Characteristics of the Sea Trout.—Length of head compared to body only, as 1 to 4; depth of body compared to whole length of fish also as 1 to 4. Teeth small and numerous, in five rows on upper surface of mouth, those on the vomer, or central bone in roof of mouth, generally extending some distance along it, the points turning outwards alternately to either side; one row on each side of under jaw, and three or four strong, sharp and curved teeth on each side of tongue. Lateral line very nearly straight. Scales adhering closely, in form rather a longer oval than those of the salmon. Colour

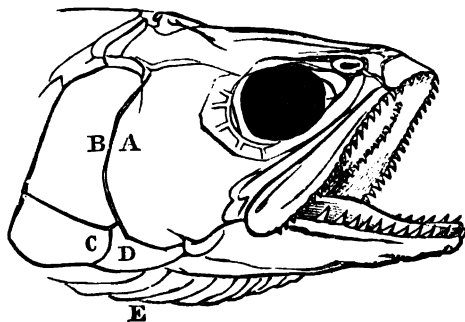
¹ In some parts of Scotland, as on the Lochy, for example, the young sea trout, or hirling, goes by the name of the phinnock, or finnock; and it is, I have every reason to believe, the 'red fin' of some of the rivers of North Wales—so called from an orange or reddish tip to the adipose fin.

when in season: upper part of head and body bluish black, lighter on sides, which are marked (principally above the lateral line) with numerous spots somewhat resembling in form the letter X. Lower part of sides and belly, cheeks, and gill covers silvery white; back fins and tail nearly same colour as back; pectoral fins small, and bluish white; anal fin and ventral fins white. Vertebrae 38.

Fin rays: D. 12: P. 13: V. 9: A. 10: C. 19.

DISTINCTIVE MARKS OF SALMON, BULL TROUT, AND SEA TROUT.

The points upon which ichthyologists principally rely in distinguishing between the three species composing the migratory *Salmonidæ* of the British Islands are the form of the gill covers, the arrangement of the teeth, the shape and relative position of the tail and of the fins, and the colouring.

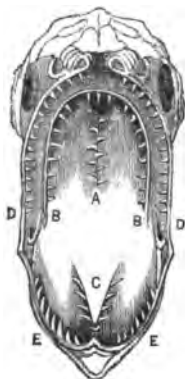


A represents the *pre-operculum*, or fore gill cover; B, the *operculum*, or gill cover proper; C, the *sub-operculum*, or under gill cover; D, the *inter-operculum*, or intermediate gill cover; E, the *branchiostegous rays*, or gill rays.

To begin with the form of the gill covers or *opercula*, which consist of four pieces, three movable, and one—the *pre-operculum*—fixed. These afford the readiest, and probably the surest mode of distinguishing between the true salmon, *salmo salar*, and the sea or salmon trout, *Salmo trutta*. In the former the hinder margin of the whole gill cover forms almost a semicircle, whilst in the latter it approaches more nearly a right angle, or a semicircle with a slice taken off the circumference above and

below. In both species the shape of the gill cover differs somewhat from that of the bull trout, and also from that of the yellow trout (*fario*), the shape of the gill cover in which last-named species is shown in the engraving on page 155.

The difference in the position &c. of the teeth, again furnishes a ready test for distinguishing the sea trout from the true salmon and from the bull trout. In the sea trout the teeth on the vomer, or central bone in the roof of the mouth (marked A in engraving) are more numerous than in either of the other species, and often remain, as shown, extending a considerable distance along



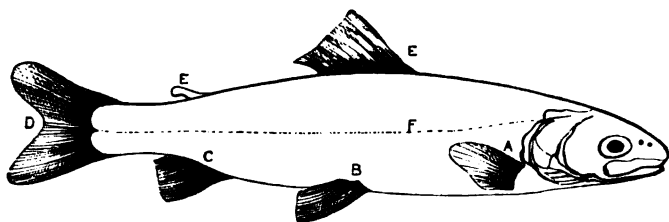
A, teeth on *vomer*, or central bone of the roof of the mouth ; B B, teeth on right and left *palatine* bones ; c, row of hooked teeth on each side of the tongue ; D D, teeth on *superior maxillary*, or maxillary bones ; E E, teeth on lower jaw, or *inferior maxillary* bones.

the bone, whilst in the true salmon and in the bull trout they are almost all lost upon the first migration to the sea, and only two or three left on the most forward end of the bone. Even these teeth, in very old fish, are frequently reduced to a single representative, or entirely disappear.

In the sea trout also, however, the teeth on the vomer diminish in numbers as the fish gets older, and will often be found in a cluster only at the end of the bone ; but they are always retained in greater numbers than in the true salmon and bull trout. The teeth generally of the sea trout are also finer

and more numerous than in the other two species, the bull trout possessing the longest and strongest of the three fish, and the salmon those of medium size—short, stout, and pointed.

Thirdly, *as to fins*. The shape and size of the tail fins are a less certain test in some respects than the teeth, as they vary



A, the *pectoral* or breast fins (so called from their being placed on the breast or shoulder of the fish); E E, the *dorsal* or back fins; B, the *ventral* fins (named from their position on the belly); C, the *anal* fin (placed close behind the anal aperture); D, the *caudal* or tail fin; F marks the lateral or side line.

much in different stages of growth. They will, however, be found a great aid to other distinguishing characteristics. They are usually as follows :

SALMON.	BULL TROUT.	SEA TROUT.
Tail fin: deeply forked when young, less so at third year; at fifth year nearly or quite square.	Becomes square at an earlier period than in salmon, and afterwards gradually convex.	Less forked than in salmon of same age; becomes ultimately square. Tail shorter and smaller than in salmon.

The shape and position of the other fins likewise differ, as will be seen by a comparison of the descriptions which follow:

SALMON.	BULL TROUT.	SEA TROUT.
Dorsal fin: Hinder origin about half-way between point of nose and end of tail fin. Third ray longest.	Commences about half-way between point of nose and origin of upper tail fin rays. Base of dorsal longer than longest ray.	Hinder origin exactly half-way between point of nose and end of tail fin. Second ray longest; same length as base of fin.
Adipose fin: Hinder origin half-way between origin of last back-fin ray and end of tail fin.	Nearer to end of tail fin than to origin of last dorsal-fin ray.	Half-way between origin of last ray of back fin and end of tail fin.

To the above it may be added, that in the salmon the pectoral fin equals two-thirds of length of head, whilst in the bull trout it equals little more than half—the anal fin also in the former commencing about half-way between origin of ventral fins and origin of lower tail fin rays, and in the latter nearer to the tail. Lastly the fins of the bull trout are more muscular and larger in proportion to the rest of its body than those in either of the other species.

In regard to colouring, the bull trout is thickly spotted with brown over the back and sides both above and below the lateral line, and even to the tip of the dorsal fin, which in the salmon is seldom or ever marked with more than a few 'splotches,' and those close to the base of the fin.

In the sea trout the dorsal fin is generally spotted like that of the bull trout though not quite so thickly.

A comparison between the characteristics given of the salmon, bull trout, and sea trout, with those of the non-migratory division—the common or brown trout, the great lake trout and the charr—will probably enable the fisherman to distinguish readily between them. The general colouring, moreover, affords in most cases a good rough and ready guide: that of the first or migratory group is always more or less greyish silver, and that of the second golden or yellow—with, in the case of the charrs, an occasional dash of crimson and orange of various degrees of brilliancy on the belly.

The charrs are, unfortunately, so seldom captured by the rod and line that they are objects more of interest to the ichthyologist than to the fly fisher.

The Sea Trout is the last of the Silver, or Migratory, Group of British *Salmonidæ*. We now come to the second division, viz. the Non-migratory species of the family, in which are included the Common or Yellow Trout, *Salmo fario*; the Great Lake or Grey Trout, *Salmo ferox*; the Charrs, the Grayling, and some other local species of no interest from an angling point of view.

THE COMMON OR YELLOW TROUT

(Salmo fario).

This species, the mainstay and principal resource of the fly fisher, is so well known, and is so widely distributed over the whole of the British Islands, as to make any detailed description of its appearance or habitats superfluous. Indeed, so far as the former is concerned, it would be practically impossible; as its colour and shape—except in the points already referred to—are susceptible of infinite difference, and vary as much as the qualities of the waters (whether in sources or feeders), geological strata of the beds, and nature and quantity of food found in the brooks, streams, rivers, ponds, lynns, and lakes, where it is bred.

Inhabiting such an infinite range of varying waters this diversity of colouring is, in fact, a defence given by nature to the trout for its preservation. Were its colour more uniform or unchangeable, the fish would be so plainly visible in different waters or soils as to fall an obvious prey to its enemies, whether biped or quadruped. In fact, experiments have shown that the changes of colour are a question of minutes rather than of days and weeks. Upon its transfer from a light to a dark coloured vessel, or *vice versâ*, the hue of the trout undergoes an instant alteration, and in a very short time assimilates itself more or less perfectly to that of its new domicile. Thus, for instance, the trout of Lynn Ogwin, almost the whole bottom of which is formed of grass, have, when first caught, a brilliant emerald gloss over their golden and yellow tints; and although the waters are of the utmost clearness and the lake swarming with fish, I was never able in any one instance to distinguish these from their surrounding green. Again on the Spean Water, Inverness, there are several small tarns in which I have frequently taken fish almost the colour of ink; yet these tarns actually join the Spean, where many of the trout are of a fine rich yellow—the cause of the difference being that the

river has at this point a bed of gravel, whilst the tarns are floored with a deep deposit of bog mud. A similar peculiarity has been noticed as regards the black-moss trout of Loch Knitching ; and Loch Katrine produces a small description of very dark trout, which probably owe their discolouration, as in many other lochs, to the drainage of the bog moors.

Even on different sides of the same river I have found complete differences in the colour and also in the edible qualities of the trout, depending on the nature of the bottom soil ; and a similar example, in the case of the fish of a small Irish lake in the county of Monaghan, is mentioned by the author of 'Wild Sports of the West.' One shore was 'bounded by a bog, the other by a dry gravelly surface. On the bog side the trout are of the dark and shapeless species peculiar to "moorish" loughs, whilst the other affords the beautiful and sprightly variety generally inhabiting rapid and sandy streams. Narrow as the lake is, the fish appear to confine themselves to their respective limits—the *red* trout being never found upon the bog moiety of the lake, nor the *black* where the under surface is hard gravel.'

Notwithstanding, however, this almost infinite range of variety in the yellow trout, depending upon local circumstances of food, &c., we have only one really distinct species common to both running and still waters, viz. *Salmo fario*, and one indigenous to lakes and similar situations, viz. the great lake trout, *Salmo ferox*.

Dr. Günther, of the British Museum, has 'recognised' another separate species in the well-known Loch Leven trout of Scotland, to which he gives the name of *Salmo levenensis*.¹ I

¹ The Loch Leven trout spawn in January, February, and March. I have had opportunities of examining many specimens of the Loch Leven trout, and their characters agreed closely with those given by Dr. Parnell from a specimen one foot in length. Of these the principal were :

Head a little more than one-fifth of the whole length, tail fin included. Depth of body at the deepest part about equal to length of head. Gill cover produced behind : lower margin of operculum oblique ; pre-operculum rounded ; end of the superior maxillary bone extending as far back as the hinder margin of the orbit. Commencement of back fin half-way between point of upper jaw and a point a little beyond the fleshy portion of the tail. End of back fin even, sometimes concave. Pectoral fins pointed

was myself formerly of opinion, without perhaps sufficiently close examination, that there was probably ground for the distinction, but having since visited Loch Leven and examined a large number of its trout, I really do not think—with great deference to the authority of so distinguished an ichthyologist as Dr. Günther—that there is enough evidence for considering *Salmo levenensis* as other than a variety—and, it must be admitted, a very beautiful and ‘sporting’ variety—of the common trout. Its excellent flavour and sporting qualities, as well as, very possibly, the more permanent differences noticed by Dr. Günther, are due to the abundance of small red shell fish on which it to a great extent exists. Some ichthyological authorities would make a distinct species out of the Gillaroo trout, &c., but the fact is all these variations are produced by the wonderful ‘plasticity’ of nature in adapting fish, as well as other animals to the conditions of climate, food, &c., in which they have to exist.

The remarkable variation, for example, in the Gillaroo consists in the thickening of the coats of the stomach, so as to afford increased muscular power for dealing with its peculiar shell-fish food. It has been said to be recognised in Lough Neagh, the largest of the Irish lakes, as well as Loughs Boffin,

when expanded; in common rounded. Tail fin long, rather narrow, and concave at the end. Tail-fin rays much longer than in the common trout, and pointed at the upper and lower extremities, whilst in the latter they are rounded. Teeth stout, sharp, and curved slightly inwards, situated as in the common trout. In the specimen described by Dr. Parnell there were 32 in the upper jaw, 18 on the lower, 12 on each palatine bone, 13 on the vomer, or central bone in roof of mouth, and 8 on the tongue. Scales small, thick, and adherent, when dry exhibiting a small ridge in the centre of each, not perceived in the common trout: 24 in an oblique row between middle back-fin ray and lateral line. Pyloric cæca from 60 to 80. Colours: back deep olive green; sides lighter; belly inclining to yellow; pectoral fins orange, tipped with grey; back- and tail-fins dusky; ventral and anal fins lighter. Gill cover (in the specimen described by Dr. Parnell) with 9 round dark spots; body above lateral line with 70 spots, below it 10; back fin thickly marked with similar spots. Foreign extremities of anal and back fins without the oblique dark bands so constant and conspicuous in many of the common trout. Flesh deep red. The Loch Leven trout has never any red spots, and the common trout is scarcely ever without them. Fin rays: D. 12: P. 12: V. 9: A. 10: C. 19.

‘These fish,’ says Dr. Parnell, ‘do not appear to be peculiar to Loch Leven, as I have seen specimens that were taken in some of the lakes in the county of Sutherland, with several other trout which were too hastily considered as mere varieties of *Salmo fario*. It is more than probable that the Scottish lakes produce several species of trout known at present by the name of *Salmo fario*, and which remain to be further investigated.

Corrib, Mask, and some others ; and, according to Stoddart, also in Lochs Muloch, Corrig, and Assynt in Scotland.

In a specimen examined by Mr. Yarrell, the number of rays of the back fin was less by two than in the more ordinary specimens of the common trout, but the numbers of all the other fin rays, as well as of the vertebrae, were identical.

Variations and deformities amongst trout have been noticed from time to time which their discoverers have doubtless been pleased to chronicle as separate species ; for instance, there is the Botling, mentioned by Dr. Davy as inhabiting Wastwater, Cumberland, which attains a weight of ten or twelve pounds, and is found in the autumn ascending the lake streams for the purpose of spawning. In form it is short and deep, with the lower jaw much hooked, or curved upwards, and, when full grown, its girth considerably exceeds its length. In the arrangement of its teeth and spots it resembles closely the ordinary trout.

Another singular variety is the 'hog-backed trout' of Plinlimmon, a fish not altogether unlike the perch in form, and there is also the deformed trout of Lochdow, Inverness-shire, in which the lower jaw protrudes a long way beyond the upper. This fish was supposed to be confined to Lochdow, but I caught similar trout with the fly in 1862 in a mountain tarn of the same county, called Roy, or Roi, from which the picturesque little salmon river so named takes its source. The elevation of the loch above the sea level is considerable, and its appearance striking, as it is situated directly below an almost perpendicular cliff, at the base of which it forms a sort of lynn or caldron. In some parts it is very shallow but in others the water is black, and apparently of immense depth ; whilst what seems to be the edge of the declivity between the two is bordered, far out in the pool, by a semicircular sweep of bulrushes cut as sharply as if with a knife.

To the trout of Carraclwddy pools, near Rhayader, has been attributed the singular propensity of *croaking*—indeed, the 'croaking trout of Carraclwddy pools' are regarded as amongst

the local lions. A writer who visited the pools some years ago as an investigator avouches the croaking. 'When first taken,' he says, 'and even after they have been in the basket for some time, they do decidedly utter a peculiar croak, which the natives attribute to their having been bewitched by the monks of Strataflorda Abbey; others again assert that it is an attempt to speak Welsh!' Although owing to the colour of the water which filters through the peat these trout are nearly black, the spots are of rich crimson and well defined, and the fins edged with the same colour. They will take the fly, it appears, three or four at a time, and thus afford unlimited sport to those who care for numbers more than size. When cooked the flavour of Carracldddy trout is delicious, and Lord Lismore, to whom the pools belong, has large quantities of them potted, when connoisseurs consider them equal to charr.

Instances of such varieties might easily be multiplied, but whenever there can be any reasonable doubt as to their specific distinctions I am all for simplifying rather than for complicating. The fewer unnecessary species that are created by ichthyologists, the more chance has ichthyology of becoming generally popular, especially amongst fishermen.

In regard to each of the two admittedly distinct species a few general observations will probably enable the reader to distinguish them without the necessity of resorting to a minute comparison.

We have not in the present case the same prominent differences in the teeth, shape of the gill covers, &c., by which the migratory trout and salmon are so clearly defined, and for ready points of distinction we must rely upon colour, external proportion, and localities; these however will generally be found sufficient for the purpose. Thus:

The common yellow trout breeds indifferently in brooks, rivers, and lakes, whilst the great lake trout is never found except in or close to lakes (generally large and deep).

The common trout is almost always spotted over the body with crimson, the spots in the great lake trout being in each case surrounded by a paler ring, sometimes of a reddish hue.

The flesh of the great lake trout is generally orange yellow, and that of the common trout pink or white, according to the nature of the water and the condition of the fish.

The disproportionate size of the head in the great lake trout is very remarkable, it being little less than one-fourth of the total length of the fish, tail fin included; whilst in the common trout it is not much more than one-fifth. The length of the head in the great lake trout is also *greater* than the depth of the body at the deepest part, whilst in the common trout it is usually *less*.

The tail fin in the great lake trout is nearly 'square' at the end, and is considerably wider than the widest part of the body, whereas in the *fario* it is very obviously narrower than the same measurement.

It may be further noticed as a mark of distinction between the two species of Trout and their congeners, the Charrs, *inter se*, that besides the orange and red colours of the latter, Trout are recognisable by the characteristic of having two complete rows of teeth on the vomer, or central bone in the roof of the mouth, whilst in the Charrs the vomer has only a few teeth, and those on the most forward part. The Grayling, though belonging to the same family, is yet so totally different in shape, colour, &c., that it is never likely to be mistaken for any of the other species.

By a little attention to the foregoing points the young fisherman will speedily acquire a knowledge of the proper names of the several species of *Salmonidæ*, and be able to recognise them when he sees them on the river bank.

As to the size attainable by the trout under favourable conditions it is very difficult to speak with certainty, the more so as, owing to the very general absence of ichthyological knowledge on the part of fishermen, they are very apt to confound the yellow trout (*Salmo fario*) with the Great Lake trout (*Salmo ferox*), and, perhaps, not unfrequently also with one or other of the migratory species which have got bronzed by remaining a considerable time in fresh water.

Amongst rivers producing exceptionally large trout the

Thames is, of course, one of the best known, and here fish up to ten pounds or twelve pounds weight are by no means rare. Indeed, I have before me an authentic record of a trout, taken in the Thames, which weighed twenty-three pounds and a half, and which is now, or was some years ago, preserved at the cottage of George Keen, fisherman, of Weybridge. This fish was taken at Shepperton Weir, if I remember rightly, with a spinning bait. At any rate the specimen is, no doubt, still extant to bear testimony in favour of its own authenticity. I have referred to another at Laleham, which weighed twenty-one pounds, and one of sixteen pounds and a half was taken by Mr. John Harris, landlord of the 'Lincoln Arms,' Weybridge, at Laleham, in 1822.

Many other English waters besides the Thames produce very large trout. I have caught some heavyish specimens myself in the Hampshire Avon, above Ringwood, and at Herdcott House, near Salisbury, there is preserved the skin of a trout taken from a tributary running through that town, which weighed twenty-five pounds, and measured four feet two inches and a half in length, its girth being two feet one inch.

This leviathan is probably the fish alluded to in the 'Transactions of the Linnean Society' as being caught on the 11th of January, 1822, in a brook some ten feet wide at the back of Castle Street, Salisbury. Mr. Powell, at the bottom of whose garden it was discovered, placed it in a pond, where it was fed for four months, until it died, when it was found that it had decreased in weight to twenty-one pounds and a quarter.

Lord Craven had some years ago a fresh-water trout of seventeen pounds from his stews in Berkshire. The trout had been known in the stew for eight years. In the neighbourhood of Downton on the Avon, a trout was caught with the fly by a Mr. Bailey which weighed fourteen pounds; and in a small tributary of the Trent, at Drayton Manor, one was taken exceeding in weight twenty-one pounds. A portrait of this fish is still in the possession of the family of the late Sir Robert Peel. A male fresh-water non-migratory trout of thirty pounds

weight, from Lough Neagh, Ireland, was cooked at Brooks's Club, in October 1832. It was beautifully spotted, and its flesh of good colour and flavour. The length of this fish was forty inches, and its girth twenty-four inches.

But here the difficulty above alluded to in distinguishing between the specimens of the *Salmo fario* and the *Salmo ferox* occurs, and in the absence of scientific verification leaves it in doubt to which of the two species this monster trout may have really belonged.

This confusion appears to extend sometimes even to the salmon, for, when I was last at Staines, there was at the Swan Inn, a picture of a huge Thames trout which was taken at Shepperton, by Mr. George Marshall, of Brewer Street, London, on the 3rd of October, 1812, with a single-gut line and no landing net; weight twenty-one pounds. The following was the subscription: 'A Thames *Salmon*!' The picture, which was not badly done, represents all the usual characteristics of a large Thames trout, except the tail, which was drawn square at the end; from the age of the fish I should naturally have expected it to have been round. . . . Possibly this Thames trout had not eaten enough whitebait to develop aldermanic proportions.

The trout is very rapidly affected by the nature of its food, as is well known to those who have compared the flesh of trout after and before the 'May-fly season.' Some interesting experiments, by Mr. Stoddart, made in order to ascertain the relative fish nourishment to be extracted from different descriptions of food, have been put on record. The trout to be experimented upon were put in three separate tanks, and in one the fish were fed daily upon worms, in another upon live minnows, and in the third upon flies of various kinds. The result was, that the fish fed on the worms grew slowly, and had a lean appearance—those dieted upon minnows became much larger, whilst such as were fattened wholly upon flies attained in a short space of time extraordinary dimensions, weighing *twice as much as both the others put together*—the bulk of food eaten

by them being actually less. On another occasion trout were kept for many years in a store stream, and tested with various kinds of diet, when it was ascertained that in some instances the increase in weight was as much as nine pounds in four years (or from one to ten pounds).

It is evident from these experiments that fish and grubs bear no comparison with insect food in point of nourishment, in consequence, no doubt, of the amount of phosphate of lime contained in the latter ; and of the insects specially contributing to fish food, probably most nutritious of all is the May fly, which, when in the larval state, works havoc amongst the trout ova on the spawning beds.

Recent piscicultural experiments have demonstrated the great value of the fresh-water shrimp also as an article of fish diet, and for feeding young fry on.

It was once my good fortune to have an opportunity of verifying the growth rate of trout when fed upon this insect which abounds in almost every stream and ditch where the water is not too turbid. In its general structure the fresh-water shrimp bears some resemblance to the common sand hopper to which it is closely allied, and its movements in the water increase the similitude. The author of the 'Fresh and Salt Water Aquarium' (the Rev. J. G. Wood, M.A.) says they act much like fish in their habit of keeping their heads up the stream, and in their general conduct look something like the fry of various fish.

Sometimes they make their way up the stream by clinging to the stones and other objects that form the bed of the stream, making quick darts forward, and then holding tightly to a stone until they choose to make a second dash onwards. When they have gone up the stream as far as they think proper they loosen their hold and come drifting back again, sometimes rolling over and over, but generally contriving to keep their heads pointing up the stream. In fact, they appear to amuse themselves by this action, just as the gnats amuse themselves by dancing up and down in the air.

The food of the fresh-water shrimp is usually decaying animal

matter, and it can be attracted by sinking a piece of half-putrid flesh in the water. When it is not engaged in active exertion, it retires to some little crevice at the side of the stream, whence, however, it keeps a careful watch so as to be able to dart out as soon as it sees anything eatable. When removed from the water the little creature is quite helpless, lying on its side, and merely spinning round and round in its struggles—a habit which has gained for it the title of fresh-water shrimp.

But to my feeding experiments. At Encombe, in Dorsetshire, the seat of the Earl of Eldon, there is an artificial pond of two or three acres in extent facing the house. The pond is paved with marble at the bottom and sides, and is supplied with water from a small fountain fed from a spring in the neighbouring valley, carried by an artificial tunnel under some high hills. The pond is, for all practical purposes, stagnant; the fountain's supply not being more than equivalent to the summer evaporation. From 1862 to 1864 this pond was drained off and left absolutely dry, in order to kill the weeds and clean the bottom. In 1864 the water was turned in again, and in August of that year a number of artificially reared trout of the same season's hatching, about three-quarters of an inch long, were put into the pond. In August 1866, the pond was again dried for cleansing purposes, when it was found that the trout had grown in the space of two years to an amazing extent—four or five pounds being the smallest size, and a weight of six pounds ten ounces having been attained in several cases.

When visiting at Encombe in September of the following year, I examined the pond at Lord Eldon's request, with a view to ascertaining to what cause, in the absence of any artificial feeding, the extraordinary growth rate was to be attributed. With the aid of a bucket and a rope, the explanation was not hard to find: *the whole pond was simply swarming with water shrimps*, and on questioning the keeper he assured me that when the water in the pond was let off there were literally cart-loads of these insects. My informant as to the facts and dates

was Lord Eldon, who also examined the keeper in my presence, as to the circumstances, whose account again was confirmed in every respect by the corroborative testimony of Mr. Dickson, one of Lord Eldon's stewards, who was cognisant of all the facts of the case, and was also present and saw the fish weighed when caught.

The only outlet to the pond is a small drain at one end up which nothing could practically pass, even if there were any trout streams at hand with which it could be supposed to communicate.

It may be mentioned that the weight of the trout at the end of the first year was from a quarter of a pound to half a pound.

In the 'New Sporting Magazine' an interesting experiment in trout growth was chronicled. The progressive weights of a female fish, regularly fed and weighed during six consecutive years, were as follows :

Date of Weighing	1835	1836	1837	1838	1839	1840
	lb. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.
April 1 . . .	0 12	1 12	3 4	5 4	7 0	7 4
October 1 . . .	1 4	2 0	5 0	5 12	7 8	7 0

At the end of the six years the fish being observed to be falling off in colour and condition was killed, when it was found to weigh less by 4 oz. than it had done six months previously.

The advent of the May fly gives the signal for the carnival of the trout to begin, and they may be seen almost with their noses out of water lying in wait to gulp down the succulent morsels which the stream floats over them. It seems, therefore, that the bliss ascribed by the poet to our

. . . painted populace

That live in fields and lead ambrosial lives,

is not without its alloys.

The voracity of trout when in pursuit of its favourite food sometimes leads to curious results. Dr. Gillespie once saw a

swallow from above and a trout from below dart upon the same May fly: down came the swallow, and up came the open mouth of the trout, into which, in pursuit of its prey, the swallow pitched its head. The struggle to get separated was short, but severe; and the swallow was twice immersed, wings and all, before it disentangled itself from the teeth of the trout. I have myself known both swallows and bats to take the artificial fly, and after an aerial combat to be ultimately netted *secundum artem*.

Although *Ephemera vulgaris* has been called the May, or 'Day,' fly—in common with its congeners, and, indeed, insects of all kinds, it appears in greater numbers and exhibits increased activity towards sunset. This, consequently, is usually the best time for taking trout with the artificial fly, and especially for the heavy fish, which until then lie concealed amongst roots, under deep holes, and in other similar shelters. The 'next best' time is during the first freshness of the morning, before the sun gets much power.

The fly fisher, in fact, cannot be too early or too late at the water; and I have often killed the best fish of the day when it was so dark that I could hardly see my rod, and had entirely lost sight of my flies. At both these times larger sized flies may be used than at others. Small flies are preferable on hot windless days, or when the water is bright and low. When water is much discoloured with rain so as to become opaque, fly fishing is useless. The two golden maxims are, first, to keep as far from the bank, and as much out of sight as possible; and, secondly, always to use finer tackle than anyone else on the river—and (your skill being equal) you will always catch the most fish.

The latter end of October or November, and thence up to the beginning of February, is the usual spawning time of trout—the operation, however, in each particular fish continuing only about eight days; and at this period the under jaw in old males exhibits in a modified degree the elongation and upward curving characteristic of the male salmon at the

same time. From the experiments of Dr. Davy, elsewhere commented upon, it appears probable that at least a proportion of trout, like some salmon, spawn only in alternate years. The situation chosen for, and the mode of conducting the spawning process are very similar to those noticed in the salmon—the eye, however, of the young fish becoming visible in about three weeks, and the egg being usually hatched in from forty to fifty days.

The yolk bag is absorbed in from three to five weeks ; and in six weeks or two months the young fly are about an inch long and able to shift for themselves. From this time their growth is rapid or slow according to the nature and quantity of their food and other local circumstances.

THE GREAT LAKE TROUT.

This fish is the ‘Ullswater trout’ and ‘grey trout’ of the English lake district, and the ‘Buddagh’ of Lough Neagh, where the smaller fish bear the local name of ‘dolachans.’ Though probably distributed throughout almost all the larger and deeper lakes of Scotland, it is, perhaps, best known amongst fishermen as the species for which Loch Awe is celebrated. It is found, to my own knowledge in Lochs Ericht, Lochy, Garry, and Laggan, and has also been recognised in Loch Shin, Loch Rannock, in Lochs Loyal and Assynt, and amongst some of the Orkney and Shetland Islands.

Besides Lough Neagh, the Great Lake trout is an inhabitant of all the largest Irish lakes—Loughs Mask, Melvin, Earn, Corrib, &c.—and is, in fact, almost wholly confined to similar great lakes and deep extensive tracts of water, where it reigns in more or less solitary grandeur, never leaving the lake except for the purpose of spawning—a process which commences about September or October—and then seldom venturing far up or down the tributary lake streams. In the river Awe, for example, the outlet from the lake best known in connection with

this species, they seldom pass the main 'hang or throat' of the river or one or two streams in connection with it.

I believe Great Lake trout to be essentially night feeders, and that during the day they lie hidden under rocks and in holes in the deepest water, only venturing into spots that are 'fishable' at the approach of evening. This is, perhaps, more an act of necessity than of voluntarism on the part of the lake trout. Its food—or at any rate a not unimportant part—consists of small fish; these are not to be found at any great depth of water, but, on the contrary, on the sloping shores, up which, therefore, the trout comes in search of them, stopping short of the shallows. Its appetite is prodigious—the stomachs of the specimens that I have caught having been constantly found literally gorged with food—indeed, the specific name, *ferox*, has been given to it in consequence of its fierceness and voracity, which are such that, having once seized a bait, it will, like the pike, allow itself to be dragged merely by its 'holding on' for forty or fifty yards, and when accidentally shaken off will immediately seize it again.

I cannot forbear quoting here some observations on the habits of this fish from the pen of an old friend of mine, now no more, but whose delightful articles on fishing, under the signature of 'Autochthon,' will, doubtless, be remembered with pleasure by many readers of these pages. After alluding to the question which ichthyologists have raised as to the distinct species of the Great Lake trout, he continues :

Till the exigencies of an exact science are adequately worked out, it must suffice to assume here that there is such a being as the Great Lake trout, distinct from the other species and varieties of the *genus*. . . .

Ferox is quite an epicure in his diet, and playful as a kitten on his own domestic hearth. In no stage of his existence can he well be confounded with his cousins of the river. Even in his infancy there is a breadth and freedom of outline in his configuration, which distinguish him at once from relatives of the same age in brook or streamlet. When viewed playing at their favourite game

of entomology, one of them exhibits a promise of future expansion never presented by the other. Not but that the latter, under favourable circumstances, is capable of reaching a considerable weight and size; but the larger he grows the less he really resembles the Great Lake type. His increase is lateral rather than longitudinal, as if the vertebræ refused to be parties in the process; and I have seen quadrilateral monsters of this type taken in small bog lakes, which weighed from nine to ten pounds, though no more than a dozen or fifteen inches long. But they were nasty tenchy creatures to look at, bad for sport, and worse for the table.

Our old friend *ferox*, notwithstanding his bad name, never makes a beast of himself in this fashion. No matter to what stature he grows, he never, till age overtakes him, loses his noble athletic and artistic proportions. In these characteristic qualities, he vies with *salar* and *trutta* themselves. Into rivers or brooks, except for the purpose of making them tributary to the propagation of his young, he never condescends to wander. Even in the lower reaches of rivers discharging into the lakes he inhabits, I have never met him in the summer months. Neither will he answer the call of inquisitive naturalists who expect to find him at home in small loughs, though contiguous to or connected by stream or river with large ones. Elbow- or, more correctly, fin-room he must have, or he will not prosper. There would appear, indeed, a certain ratio always to exist between him and the extent of water he requires. In this he, of course, only conforms to the supposed law of harmony which is said to prevail between all organisms and external circumstances. But why other little fishes in the same waters do not conform in the same way the philosophers do not tell us. It is probably certain, however, that in lakes less than three miles long, and half that in width, a genuine specimen of the *ferox* will not be found. The physical features, too, of the ample basin he loves to sport in, besides mere extent, have doubtless much to do with his health and happiness. Shingle beaches, marly bottoms, precipitous rocks, fathomless water valleys, and corresponding elevations of sharps or sunken islands, to which in the summer he resorts to have a charge at the sticklebacks, or a tumble at his favourite ephemeridæ, constitute some of the domestic requirements for his full development. As a variety he has no objection to a certain amount of bog shore; but it is obvious it does not agree well with his constitution—his fine colours suffering there, and his whole physiognomy becoming bilious and jaundiced.

If brooks or rivers are not at hand, he and madam *ferox* provide heirs to the estate in some nice gravelly or sandy creek of the lake. For this I can answer, having frequently been a witness of their connubial happiness, standing with hymeneal torch in hand over the nuptial bed on a dark November night. How many seasons the amiable couple may live to visit the gravel beds is rather a difficult question to answer. The registry of births, deaths, and marriages in such remote and obscure places as the depths of a 'great lake' furnishes but doubtful data for the statistics of the ages of the population. Neither have we, in this case, the 'equine marks' of the teeth, or the 'annual vegetable rings' to appeal to. The probability is that the happy pair live to a good round age, though it might be imprudent to reduce it to figures. The pounds avoirdupois which they are found to weigh, after they attain a respectable size, may possibly give a fair approximation to their respective ages.

Sooner or later, however, the day of decline arrives. Fly fishing or trolling, I have hooked during the season occasional specimens of a long, tapering, large-headed animal; all skin, bone, and fins, like a flying fish, but languid in his movements, voracious in his appetite, and seemingly indifferent to his fate. Shall the melancholy fact be recorded?—it is our once gallant friend, *ferox*, who would in better days run out forty yards of line in a breath, spring from the lowest depths of his domain above the surface with fly or roach in his mouth, and contemptuously turn up his nose half a dozen of times at a net or gaff; but now, alas, wabbling about like a miserable snig in his dotage and decrepitude! And as if this were not sufficient humiliation for the pride and paragon of inland waters, the rustic fishers, no more respectful of his character than the ichthyologists, have combined to call him in this state a 'piper.' *Date obolum Belisario*—gently remove the hook from his aged jaws; return him safely to his native element, and crown the deed of charity by sending after him as many loaches as you can spare. When you next visit the lake you will probably witness his obsequies performed and his bones picked by a merciless group of seagulls and scarecrows, screaming and howling over his remains, as they are buffeted about by the waves. Such is the natural end of *ferox*—full of indignities, indeed, but from which it is consoling to reflect that the insensibility of death has plucked the sting!

The food of this distinguished member of his family, like his

place in systematic arrangements, has been a matter of doubt and dispute. That his whole bill of fare cannot be correctly filled up is very probable. But sufficient data, I think, exist to make out a tolerable *carte* of his favourite dishes. Oh ! those words of learned sound, and little meaning, that must be used to describe this food in the jargon of science, make one almost shudder. That he is, then, *insectivorous*, *vermivorous*, *molluscivorous*, *piscivorous*, and probably *herbivorous*, is all but certain. I have taken him with at least twenty different kinds of lake flies. I have seen him in his junior state, dragged up like a malefactor amongst slimy eels on a night line baited with worms. He has risen to my hook baited with five species of little fishes—namely, the loach, stickleback, fry of trout, and pike, and the gudgeon. His addiction to these dainties has been proved to me numberless times by a very unwilling visit to my net.

There is, however, so far as I have been able to observe, one condition necessary to his indulgence in these luxuries. They must be in a comparatively minute form, and presented to him on a link of clear, clean gut. As a general rule, the limit of his taste in this respect does not exceed baits of three or perhaps four inches. He must be hard up for a dinner if he goes beyond these dimensions. To be sure it has been stated—what, indeed, of fishes has not?—that, like the pike, he attacks prey of a considerable size. Possibly this may be so. . . . Yet I have trolled with pike tackle and larger baits, how often I know not ; but never, in any instance, did *ferox* favour me with a call while engaged in this kind of work.

Of his feeding on small shells and larvæ, which are to be found in large quantities on the bottom of lakes, the evidence, though inferential, assumes a look of certainty, on examining the contents of his stomach. The *débris* of these semi-digested creatures is there to be seen and felt clearly enough. Amongst the mass are traces of apparently green vegetable matter ; but whether these are the remains of a salad of aquatic herbs is problematic.

Whatever be his food, there is no doubt that the Great Lake trout will attain, under favourable conditions, to a very great size, though I have never happened myself to meet with any remarkably large specimens, either alive or stuffed, nor do I find any such authentically recorded. Stoddart mentions one

which he saw and weighed himself that was a trifle over nineteen pounds. This was taken from Loch Awe. I remember, however, in Windermere, where I used to go out occasionally night-trolling for *ferox*, the fisherman would entertain me with stories of monster fish taken within his knowledge, beginning, I think, at about twenty pounds, and progressing night after night—perhaps to stimulate my flagging energies—until I should say that the limit reached by the chronicle attained something like thirty-five or forty pounds.

In the neighbourhood of Loch Awe there are also traditions of exceeding giants—twenty-five, thirty, thirty-five pounds—but these are not to be found in the records of any living angler, and when we hear yarns about these leviathans caught by the fishermen of a former generation, we are reminded of the Scotchman's retort as to the size of the fish caught by his rivals: 'They're nae bigger fish, but only bigger leers.' In some of the continental and American waters the above weights, exaggerated as they doubtless are, are dwarfed by comparison into insignificance. Lakes Michigan and Superior abound with monster trout of such a size as to set at defiance all attempts to capture them with rod and line. One of the smaller sized of these fish (weighing only seventy-two pounds !) was, however, actually caught by a fisherman in Lake Huron. Some curious facts respecting the habits of the Huron trout are mentioned by Featherstonhaugh in his 'Canoe Voyage up the Minnay Sotor.' 'Upon one occasion,' he says, 'Mr. Riddle caught one of the great trout of this lake, which when it was drawn up, had a large white-fish (*Coregonus albus*) in its throat, with the tail sticking out of its mouth, whilst inside the trout's stomach were two more white-fish, each weighing about ten pounds. In the lake of Geneva the trout run also to a monstrous size, but whether they are identical with the *Salmo ferox* is very doubtful. Formerly it was supposed that they were, but Agassiz pronounces to the contrary. Dr. Henry Bennett, of Mentone, is one of the few Englishmen that I know personally who has had any sport in trolling for these Geneva trout. His description of

his tackle and the weights he used to lead his line, was unique.

In Sweden, a writer, formerly well known to readers of angling literature under the *nom de plume* of 'An Old Bushman,' gives thirty pounds as a weight frequently attained by the Great Lake trout in the waters of that country. The marks by which he distinguished the *ferox* from the *fario*, when of a greater weight than, say, eight or twelve pounds, were 'the thick clumsy form, the great square tail, and the dull bluish steel colour of the body, with but fewish spots.' His conclusion, however, it should be stated is rather in favour of the lake trout being merely overgrown specimens of the *Salmo fario* than distinct species, an opinion boldly advanced also by that thoroughly practical fisherman, Mr. Thomas Tod Stoddart, in the teeth of Yarrell, Couch, Selby, Wilson, Jardine, and other ichthyologists.

In the parr or early stage of growth it is very difficult, if not impossible, to distinguish between the young of the *Salmo fario* and of the Great Lake trout.

I believe that neither in this country nor in Sweden does the *Salmo ferox*, under ordinary circumstances, rise to the artificial fly, at any rate when he has arrived at anything like maturity, and the only effectual way of taking him is by spinning. Such hints as I am able to offer on this subject will be found in the chapter devoted to lake trout spinning.

[In order to an adequate comprehension of the theory and practice of fly fishing, some general acquaintance with and knowledge of the art of making and using the tackle employed, as also of the habits and history of the several fish it is proposed to 'angle' for, are clearly *desiderata*. They are, in fact, the alpha and beta of the business, the ultimate 'catching' playing the part of omega.

These two important preliminaries being now, however, supposed to be more or less mastered, and the neophyte having become to some extent a naturalist as well as a fairly good judge in the matters of rods, lines, hooks, &c., the next point is to apply his knowledge to the practical business of fly fishing, beginning, as is but respectful to the king of fresh waters, with fly fishing for Salmon. This subject, for the reasons stated in my Prefatory Note, I have committed to other and more orthodox hands.

A safer pilot through the shoals and quicksands of the art than Major Traherne, or a more experienced and practical exponent of its mysteries, cannot be found within the 'three seas that girth Britain.'—H.C.-P.]

SALMON FISHING WITH THE FLY.

ALSO A FEW NOTES ON FLY FISHING FOR SEA TROUT.

It is with great pleasure, although with considerable diffidence, that I accede to a request, made in very complimentary terms by Mr. Cholmondeley-Pennell, that I should write an account of my experience in salmon fishing; and I am induced to do so in the hope that it may be instructive to gentlemen who are inexperienced in the art, and also to a certain extent interesting to the angling public.

There are certain well-known and established facts connected with salmon fishing that need no mention on my part, and I will endeavour to confine myself, as far as I can, to the relation of that which I know of my own knowledge. During an experience of over thirty years, in England, Scotland, Ireland, and Norway, I have had most favourable opportunities of studying the habits of the salmon and the art of fishing for him, and, if any information I am able to give should prove useful to my brother fishermen, I shall be amply repaid for my trouble.

All the knowledge we possess of the habits of the salmon has been acquired during that period of his life which he passes in fresh water. We know nothing of his habits during his sojourn in the sea, except that at certain seasons of the year he feels his way along the coast until instinct teaches him he has found the estuary of the river he has been bred in, and he then makes his way up it. From this time until, in the natural course of events, he returns to the sea, we have many opportunities of studying his habits, and we get to know certain facts, from which we draw our own conclusions. We start theories without end, some of which, after a short argument, will be found utterly baseless; but others seem more plausible, and have a certain amount of evidence to support them, such as may make it reasonable to assume that we have arrived at something like a near approximation to the truth.

We know a salmon enters fresh water at certain seasons of the year for the purpose of propagating his species, that sooner or later he makes his way to the locality where instinct points out to him he is to deposit his spawn, and that on his journey upwards he will occasionally take whatever bait is offered him by the angler. When the time comes he deposits his spawn, after which he gradually makes his way down the river and re-enters the sea. The sea is his native element, and I think it must be taken for granted that he feeds voraciously during

his sojourn there : in fact, he must do so, otherwise he could not grow so rapidly or attain such condition in the short time it is known he has to stay there. Nature has provided him with a formidable set of teeth, and it may be presumed he makes the best use of them.

When he first enters fresh water he is in his prime, and in the full glory of his strength. Doubtless instinct teaches him not to leave the salt water before he has attained this condition that he may be able to surmount the difficulties he will have to encounter before he can reach his spawning ground. A half-conditioned, ill-fed fish could not accomplish this : his strength would be exhausted before half the journey was completed, and he would probably be no more seen. A fish in this condition is seldom caught by nets in fresh water or on the sea-coast.

There is great difference of opinion as to whether or not a salmon feeds in fresh water. In my opinion there is positive evidence that he does ; otherwise, why does he take flies, live and artificial bait, worms, and shrimps ? Is it to be supposed for a moment that if he takes these he will not take any other food fresh water affords him ? It is true he deteriorates in condition from the date of his migration from the sea : but this may be accounted for by the fact that the food the river affords is not of that fattening nature which he gets in the sea, and Nature evidently did not intend he should remain in the same prime condition in fresh water as when he entered it. He has to undergo certain changes before he is in a fit state to spawn, and, if he remained in the same prime condition as when he entered the river, this would be impossible.

It is well known that a newly run salmon will take a fly or bait sooner than one which has been a longer time in fresh water, and I could quote many instances to prove this. A few years ago I was fishing in the north of Norway, where there was a large pool under a fall which was impassable for salmon. The fish congregated in this pool in vast numbers, but I seldom killed one in it that had not sea lice on him. (The presence of

sea lice is a certain sign of a new-run salmon : these parasites die after being twenty-four hours in fresh water.) I also remember, when fishing in the Galway river, in Ireland, in the spring months, where from twenty to thirty salmon were killed daily with rod and line, nine out of ten had sea lice on them. The fish congregated in the stream below the weir in thousands, and, although they had only been a short time in fresh water, they did not seem to care much about feeding.¹

To account for this satisfactorily is impossible, but it may be reasonable to assume that for the first few hours after a salmon has left salt water, where he has been in the habit of feeding voraciously, his appetite does not leave him : but eventually the absence of the food he has been accustomed to will make him sulky and disinclined to feed. He is in such good condition that he can afford to abstain for a while ; but he will sooner or later be obliged to feed to maintain his strength, in order to enable him to reach his spawning ground. It is not to be supposed he can exist on water, and we know that at times he takes a fly or bait greedily, particularly after a 'fresh,' when he shifts his quarters up stream. He will then take the first fly he sees ; but when once he is lodged it is generally difficult to get a rise out of him.

There is a certain time of year when salmon are less inclined to feed than at any other period—this is generally from about the middle of July to the middle of September. The temperature of the water and of the atmosphere is then higher than at any other time, and this has doubtless a great

¹ The most extraordinary thing is the difference in the habits of salmon in different rivers. In the Spey, for instance, in Scotland, fish rise most freely, and as freely take the fly, almost in the tide-way, which comes up but a short distance. In the Wye, where the tide runs ten miles up, the fish do not take freely till they have run up seventy miles. Does this result from the fact that the Spey fish are never in muddy water? the sea and river being quite clear and the bottom pebbly, whereas the fish come twenty miles up the muddy Severn and then have ten or more miles of muddy Wye besides to run up before they get to clean water. This may make them so sick that they do not recover before reaching the Hay in Breconshire, and only above that, seventy miles from the mouth, do they take freely.—ED.

effect on the appetite of a salmon. I have found this to be the case upon almost every river I have fished. It matters little whether the fish are fresh-run or stale : they are indifferent to taking food, and it is quite exceptional to get a good day's sport during those months. They begin again, however, to take at the latter end of September and up to the time of the close season ; but these are mostly gravid fish, and hardly worth the trouble of fishing for.¹

After a salmon has spawned he is at his lowest ebb—thin, emaciated, and unsightly to behold. He then gradually makes his way to the sea, but, as it is necessary to recruit his strength before he finally leaves fresh water, Nature seems to have provided him with ample means for so doing at this particular season, as on his downward journey he is accompanied by millions of the fry of his own species, and it is supposed he makes such havoc amongst them that it has been in contemplation to alter the salmon laws, making it legal to take spent salmon after a certain date. I have seen spent salmon in such a condition that it has been difficult to distinguish them from newly run fish.²

It is commonly believed, because nothing has ever been

¹ In all rivers August is the worst. 'Soolky Agust' (sulky August), the Irish fishermen call it, the warmth of the water making fish sick and idle—in Canada the latter half of July is as bad—but throughout Scotland, Ireland, and Wales I have found fishing to be worst in August.—ED.

² In 1879 I got to our camp on the Natasquham on the borders of Labrador, a Lower Canada province of Quebec, on June 9. The river was full of thousands of fish bright as silver, and apparently in first-rate condition. They were every one of them mended kelts, i.e. fish of the previous year that had spawned in October or November, and, for some unaccountable reason, had not returned to the sea. Usually at that season there are *no* fish in the water, but just within a week, sooner or later, the new fish come up. That year the old fish did not go down till about June 20, and no new fish came up before July. The mended kelts are useless for food, and scarcely any of them would rise. I went away across the gulf to the Ristigouche between New Brunswick and Lower Canada on June 27, not having seen a fresh-run fish, and only killed half a dozen kelts on the Natasquham. One of my friends who stayed through July often killed twenty-five fish a day. From June 10 to the 20th I could sit on a rock and count from sixty to eighty fish jump in a pool within an hour. No one could account for this unusual delay in the going down of the old and coming up of the new fish.—ED.

found in the stomach of a salmon, that he does not feed. A friend of mine, who takes the greatest interest in this subject, told me that, when he was fishing in Norway some years ago, he cut open every fish he caught (thirty in number), and did not find anything inside any of the salmon, but three of the grilse were gorged with insects, which he thought were daddy-long-legs. This is the only instance I ever met with of food being found in the stomach of a salmon ; it is, of course, an exception : but if any evidence were wanting, this of itself proves that salmon will feed, though how to account for the absence of food in their stomachs is a puzzle. I have often noticed, fishing with natural bait, when a salmon is landed the bait is torn from the hooks and sent up the line a foot or more. Does not this show that a salmon has marvellous power of ejecting its food ? Is it not probable that, when he gets into trouble, either by being hooked, or netted, he will disgorge the contents of his stomach ? A trout that is full of food will, we all know, do so after he is landed—and why not the salmon ? My friend who told me he found food inside the grilse also said that several Norwegian net fishermen informed him that, after their nets were drawn in they generally found a number of half-digested fish amongst the salmon thus caught. He also said he had heard the same story at Newcastle-upon-Tyne. If these fishermen spoke the truth, it goes a long way in support of my theory.¹

The absence of food in a salmon's stomach has been accounted for in one other way. A salmon may have such powers of digestion that whatever food he consumes disappears almost at once ; but against this supposition there is the fact of what my friend found inside three grilse. As it is certain grilse are only salmon in youth, this theory must fall to the ground, and I am inclined to think the former explanation is the correct one.

¹ From my own experience I fully endorse this. Salmon must feed in fresh water, or they would take neither fly nor bait—spoons, prawns, or anything else. Yet I never found anything in their stomachs ; they must eject it when in trouble.—ED.

A spring salmon will not travel as fast as a summer salmon. The rate at which salmon travel is dependent upon the state of the weather and the temperature of the water. Should there be a hard winter, lasting, as it often does, well into the spring, hardly a fish will have found his way to the upper waters ; but should there have been an open winter, with good travelling water and no obstruction, the upper reaches will be fairly stocked by the time the fishing season commences. Of course there are exceptions, and, however mild the spring may be in some rivers—for instance, the Wye and the Usk in Monmouthshire and Brecknockshire—spring fish will not travel above a certain distance, and the upper waters do not get stocked until well on in the season. In Scotland the temperature of the water in the early spring is always very low, and obstructions in the Scotch rivers stop the fish running, so that they will not pass these until the weather gets warmer and the temperature of the water higher.¹

On the Helmsdale and Shin, in Scotland, are falls over which salmon can easily pass, but they will never do so until the month of April, and it is known almost to a day when they will make their appearance in the stream above these falls. That salmon are very susceptible to cold is quite certain ; although they are fresh out of the sea, and in their prime condition, and will take a fly or bait greedily, yet they will not lodge in a rapid stream in the early part of the spring, but are always found in easy water, just where one would expect to find a spent fish ; and it is not until well on in the spring that they will lodge in rapid water.²

¹ Is it not probable that the big fish travel slower than the smaller ones, as in all rivers the first school of fish that come in are the biggest and heaviest during the year, and each subsequent school is successively smaller ? Also as the weight and volume of water coming down are greater in the spring than the summer, does that not probably make the progress of the fish slower in spring ?—ED.

² Who can account for the fact that when you cannot find, or certainly see or rise a fish on the Lochy in the early spring, you can take scores on the Garry of beautiful large salmon in prime condition ? The shortest journey to the Garry is through the river and loch Lochy, and yet the fishermen will tell you

The climate of Ireland is milder than that of any other part of the United Kingdom. The temperature of the water is consequently much higher than in either England or Scotland, and many newly run salmon will be found in early spring in the upper waters of Irish rivers where obstructions exist. The majority of them, however, seem to object to face an obstruction until about the month of April, when the weather gets warmer.

A lake is a great attraction to a salmon. If there is no obstruction between lake and sea, a spring salmon will, on leaving the salt water, make straight for the lake without halting. This is particularly the case in Irish rivers, where the temperature of the water is generally high for the time of year.

Autumn salmon are different in their habits from spring and summer fish. For some unknown reason they remain in the sea until they are full of spawn, and then, not being able, on that account, to surmount the difficulties which a spring or summer salmon is capable of, are seldom found above a certain distance from the sea. Their journey up is also a very slow one, and I have always noticed this peculiarity in the habits of an autumn salmon.

In many of our rivers the heaviest salmon of the season, in splendid condition and in appearance like spring salmon, run during the winter months. The run commences in the autumn, when now and then one is caught, but the great run takes place in December, and I often think it is a pity we are prohibited by law from fishing for them.¹

that the fish in the Garry come from the east and not the west coast (which is close by), and come all the way up the river Ness and through loch Ness, double the distance to the Garry, and whilst they are being caught there in numbers, not a fish could be seen or caught on the Ness. In July and autumn when sport is fast and furious in the rivers Lochy and Ness, not a fish is to be seen in the Garry.—ED.

¹ This is peculiarly the case in the Wye. Up near Bulth in December, beautiful fish called Blue Cocks appear. The Wye Fishing Board, of which I am Chairman, gave permission a few years ago to the Honourable Major Geoffrey Hill to catch some of these for scientific purposes. As yet he has not succeeded in doing so.—ED.

If the rivers that are frequented by these fish were closed from October 1 to December 15, and angling only allowed after the latter date, there would be far less harm done than by allowing angling during October and November, when almost every fish hooked is gravid.

By December 15 every gravid fish will have left the pools for the spawning beds, and the catches will be occupied only by those heavy, fresh-run winter salmon. No doubt there are objections to allowing angling during the winter months, but it is a pity we should lose the sport these splendid fish would afford. It is true they can be caught when the season opens in the spring, but by that time they get 'foxy' and have lost condition, and are only fit for kippering ; as it is, they do an immense amount of mischief among the smolts in their downward journey to the sea, and we should be far better without them.

Having introduced the salmon to the notice of my readers, I will now endeavour to describe the best way to catch him, and, as it is the most important part of a salmon fisherman's gear, I will commence my remarks with

THE ROD.

I have tried all sorts and sizes of rods, by various makers, but the one I am now using, and have used for many years, is to my mind perfection. It is a greenheart in three splices, made by Farlow, and, if a rod is to be judged by its powers of casting, it should be a good one. It is the one with which I won the first prize at the Fishing Tournament at Hendon, in July 1884, for the longest overhead cast, with a cast of forty-five yards one inch. To cast a long line, a rod requires great lifting power, and my rod possesses this quality to a great extent, although, at the same time, it is not heavy enough to tire one in a hard day's fishing. I am at a loss how to describe it, but its virtue lies in an equal distribution of strength, in proportion, from the butt to the point.

A heavy butt with no spring to it, and with a weak top, is of little use for casting purposes, beyond a certain distance. The spring should be felt, to a certain extent, to the bottom of the butt when casting, and I consider a rod which does not possess this quality of little or no value. Castle Connell rods are made on this principle, but, in my opinion, they are too top-heavy. If they had a little less weight at the top and more in the butt, I think they would be pleasanter to fish with and would lose nothing in power. They will doubtless cast as long a line as rods of other descriptions, but, owing to their being so thin at the butt and so top-heavy, it often happens that, when throwing a long line in a gale of wind, they are apt to smash just above the reel. I fished with these rods for years, but for this reason I discarded them. They are, however, very powerful rods, and well suited to the Shannon, where the fish run very heavy and a powerful rod is required; and, as all fishing is done out of a boat on that river, long casting is unnecessary.

Every rod requires a line to suit it; and it will be as well to bear in mind when making a choice of one that a rod with a weak, whippy top is not suitable for casting thick lines, and a stiff or more powerful rod is not adapted for casting a thin line. The best wood for a rod is green or brown heart. It is very light and pleasant to fish with: the only drawback is that rods made of it will sometimes smash at a moment's notice without any apparent cause.

I have sent my favourite rod to Farlow's, and, should anyone wish to try one made on the same lines, he will be able to obtain it at that establishment. In choosing a rod, a novice will walk as it were blindfolded into a fishing-tackle maker's shop, and generally order the biggest rod he can get, and of a calibre which will tire him in half an hour. A big rod seems to be a necessity to him, and a gentle hint from an older angler that the rod is rather too heavy is not often taken in good part. It is only by bitter experience that he will find out his mistake. If fishing-tackle manufacturers would but 'take stock' of their customers, and recommend the beginner to choose a rod

which will be found suitable to his strength, it would be no loss to them, and would save a great deal of disappointment. It would, moreover, start the novice in the right road to success ; whereas, if he begins fishing with a big rod that is over his strength, he will have probably to toil and labour for weeks before he can make a decent cast, which he might have succeeded in accomplishing in a day or two if he had taken a friend's advice.

A seventeen-foot rod is quite long enough for any ordinary casting for salmon, provided it is of sufficient power. A sixteen-foot rod is long enough for peel or grilse fishing, or even for salmon, when the water is low and where fine tackle and small flies are required. Anyone who has read the reports of the Casting Tournaments at Hendon, will see what marvellous casts were made with sixteen-foot rods : but they must be made of good stuff, with plenty of lifting power. Fishermen of any experience will of course select a rod to suit their own fancy, but I strongly recommend the novice to make his first effort with a rod under his strength, and, above all things, to avoid using one with a weak, whippy top.

The art of rod-making has been brought to great perfection in America ; the split-cane rods are marvellous works of art, and are being much used in this country ; but they are very expensive, and, as I cannot discover any particular advantage they possess over our old-fashioned English-made rod, I prefer to use the latter.

THE REEL AND LINE.

It is a great mistake to fish with a big, heavy reel, as every ounce of needless weight in reel or rod will tell against the angler in a hard day's fishing, as surely as it does upon a race-horse when running a race. A man who thinks it necessary to fish with a big rod generally uses a big reel to match, with as much line as it will hold, very often needlessly thick. To make a clean cast the line must be used to suit the rod. When fish-

ing with a powerful rod a moderately thick line is required, a thin line, as I have before remarked, being of no use. A reel four inches in diameter, with a drum of $1\frac{3}{4}$ inch in width, will hold thirty or forty yards of thick line for casting purposes, and 100 to 120 yards of thin back line—in all about 140 yards, which is long enough for any of our rivers. The majority of fishermen use a thick line, of the same thickness from end to end; but, as I think it may be taken for granted that forty yards only, at the outside, are required for casting purposes, nothing is gained by the remainder of the line being of the same thickness.

I will endeavour to show that there is a great disadvantage in using a continuous thick line, and that there is a good deal to be gained by using a line made as I have described. When fishing with a continuous thick line, should a salmon take a long run when hooked in a rapid stream, the pressure of the water upon the line is so great that, unless the casting line is of unusual strength, there is great risk of its getting broken. On the other hand, fishing with a thin back line, the resistance to the water in a like case is so much less, in proportion, that the chance of bringing the fish to bank is far greater and the risk of a break reduced to a minimum. Another advantage in using a thin back line is that the reel of the aforementioned dimensions will hold a far greater length of line. The line I recommend, say thirty or forty yards, is tapered at both ends, and moderately thick in the middle. The advantage of having this line spliced to a back line is that when one end is worn from casting it can be cut off, the worn end respliced to the back line, and the other end brought into use. Anyone who has not fished with these tapering lines will be surprised at the ease with which they can be cast, and their superiority will be found out when fishing on a windy day. Some say it is best to use a light line upon such an occasion, because it cuts through the wind better than a heavy line, but in my opinion a light one is utterly useless for casting purposes upon a windy day, and the heavier the line the easier it is to cast.

Thicker lines are required for spring and autumn fishing,

when large flies and strong tackle are used, but in the summer time, when the peel commence to run and small flies are used, light springy rods and light lines are preferable to the heavy salmon rod, and far more pleasant to fish with. The mouth of a fresh-run peel or grilse is very tender, and the strain likely to be put on the line when the fish is hooked will, if a heavy salmon rod is used, be very apt to tear the hook out. Very little strain is required to fix the barb of the hook, and when fishing for peel the fish should be very lightly handled ; easy-running reels should be used when fishing for either salmon or peel, but most particularly so when fishing for the latter.

The tapering lines I have mentioned can be obtained of any length or thickness to suit the angler's fancy, dressed or undressed. I prefer to buy them undressed and dress them myself. An undressed line will last quite as long as a dressed one, and be quite as pleasant to cast, but care should be taken to dry it each day after fishing. I have an undressed line that I have used for two whole seasons, and it is now as sound as the day I bought it. This is more than I can say of most dressed lines sold by fishing-tackle makers, which will seldom stand more than one season's work.

In selecting a dressed line care should be taken to ascertain it is not hollow. A hollow can easily be detected by cutting off the end of the line with a pair of sharp scissors. My objection to a hollow line is this, that should there be a flaw or bruise the water will gradually find its way into the hollow, run down the whole length of the line, and as owing to the outer coating being waterproof the line cannot be dried, it will therefore quickly become rotten. I have seen many lines that have been used only two or three days become quite rotten, which I am convinced has been from no other cause than the one I have mentioned. A hollow line may be easily known, as it is round ; a solid plaited line is square.

DRESSING LINES.

The following recipe for dressing lines I can safely recommend. Mix equal parts of raw linseed oil and best copal varnish, boiling until the mixture singes a feather (this should be done out of doors, owing to the inflammable nature of the solution). When cold put the line in to soak. A week will be enough for a solid plaited line, but if the line is hollow it should remain in much longer so as to allow time for the solution to fill up the hollow. When thoroughly saturated, a fine day should be taken advantage of, and the line put out to dry in the open air, stretched at its full length, fastened at both ends to two wooden posts, all the superfluous dressing being carefully removed with the hand or a bit of cloth. It should not remain out, in its first stage of drying, in the rain, as a very few drops will spoil it, and the dressing will come off; but when the outer coating is tolerably dry, which will be in about a week in warm weather, wet will not affect it, although it will be advisable not to leave it out in the rain at any time if it can be avoided.

In about a fortnight after it has been out the line should be redipped in the solution, and the operation of stretching and removing the superfluous dressing repeated. This will be found sufficient, and nothing will remain but to allow it to dry.

A line should not be used for at least six months after being dressed. It may be hung up indoors, but it will be advisable whenever the weather is favourable to put it in the open air. The best months for performing the operation of dressing are June, July, August, and September, the temperature being higher during those months than at any other time of the year. Dressed lines can be dried in a very short time by mixing 'dryers' with the solution, but there is the greatest objection to their use. The object of the wholesale manufacturer, owing to the great demand, is to get the operation performed as soon as possible, and therefore dryers are required; but the consequence is, although lines dressed in a solution in which dryers have

been used look like perfection in the fishing-tackle maker's shop, it will often be found after they have been used a very short time they will 'knuckle,' when they may just as well be thrown into the fire. There is no mistaking a 'knuckled' line, and nothing can be more unsightly. Instead of being the beautiful even-looking coil that came out of the fishing-tackle maker's shop, about every two inches or so, where the line has passed through the rings of the rod, the varnish comes off in dust, and a small white ring appears, giving the line the appearance of the knuckles of the finger.

I have seen many of the best American dressed lines 'knuckle' in a very short time and become quite unfit for use. After paying a good price for a line, nothing to my mind can be more annoying or disappointing, and if this were to happen in a far-off country where there were no fishing-tackle makers' shops, for instance in Norway or Canada, the consequences might be very serious. This evil can, however, be avoided by dressing lines in my fashion, and these I will guarantee to last for years if taken care of and dried every day after fishing. I would not trust the best looking dressed line that ever came out of a fishing-tackle maker's shop ; but the wholesale manufacturers are to blame for this, and not the fishing-tackle makers, who as a rule do the best they can to supply the best article for their customers. I would recommend anyone who has time to spare to dress his own lines, but without dryers ; or, if he has not any time to spare, to use them undressed. An undressed line will get saturated with water after the first cast, and this supplying the place of the dressing, the line will be found quite heavy enough to make the longest cast required. The only objection, and it is but a very trivial one, to the use of undressed lines, is that should it be desired to add to the length of a cast by pulling out a yard or so of line before the cast is made, when this is let go it is very apt in its wet state to get twisted around the butt of the rod, which will defeat the object.

CASTING LINES.

The selection of a suitable casting line (i.e. the gut line that connects the reel line with the fly) requires great judgment and care on the part of the angler. If the water should be high or stained after a fresh, the strongest lines may be used, and finer ones in proportion as the water gets lower and clearer.

During the early spring months salmon are keener to rise at the fly than at any other time of the year, they will take larger flies than later in the season, and do not seem to care what the casting line is made of ; but during the later spring and summer months, when the water is very low and clear, they are more particular, and very fine casting lines and flies, not much bigger than trout flies, must be used. To land a big salmon in low water with a light rod and fine tackle, is a feat any salmon fisher may be proud of.

Treble-twisted or plaited gut casting lines are generally considered the strongest, but these are not to be trusted. Some of them will doubtless last a long time, but many are made up of inferior cast-off gut which is difficult to detect in the piece, and would not stand a week's work. It is also difficult to twist gut so evenly that when a fish is being played, an equal strain shall be made to bear on each strand.¹

Lines made of two strands of carefully selected round salmon gut of equal thickness, untwisted, are much stronger than most of the treble gut casting lines that are generally used, but great care must be taken in making these lines, as when the links are knotted together it will be found that, nine times out of ten, one of the strands will be longer than the other, consequently the shorter strand would have to bear the whole strain when a fish is being played, and the other strand would be useless. This can be avoided if the following directions are attended to : after the strands that are to compose the line

¹ I call a piece of gut taken singly 'a strand,' and when made up in a casting line 'a link.'

have been selected, and have been allowed to soak in cold water for some hours, take the two that are to form the first link, and having made the loop that is to connect this with the reel line, whip the strands tightly together (this need not be done closely) with well-waxed silk, from the knot where the loop has been made down to nearly the ends of the strands. Knot to the next link and remove the whipping, when it will be found that the strands will lie evenly together and any strain that is put on will be equally shared by both. Commence whipping from the last knot made in the manner above mentioned, and continue until the casting line is complete. I myself never use anything but single gut, unless fishing in big rivers, but I make up my own lines and take great care to use only the strongest gut.

Not long ago I discovered what I thought was a new method of fastening strands of gut together without knots, but I have since found that the invention was not a new one, and that my plan had been adopted years ago by Mr. Cholmondeley-Pennell, and described in his book 'The Modern Practical Angler.' His principle and mine are identical, although somewhat differently carried out. *The result, however, is that in both cases the fastening together of the gut in a casting line is the strongest part of it.*¹

On testing a line so constructed with strands of ordinary salmon gut, dry, it broke at a strain of 15 lbs. in the middle of one of the links and not at the fastening.

Another line of apparently the same strength, the links of which were fastened together by knots in the ordinary way, broke at a knot at a strain of $7\frac{1}{2}$ lbs. A third, again, made of two strands of the strongest picked gut, untwisted, without knots, pulled the index of my steelyard down to 20 lbs. without breaking. I am certain it would have stood a strain of several pounds more, but I was content with such a result, and I feel satisfied that such a line would hold the biggest salmon that

¹ See description of the knot, p. 41 (chapter on 'Tackle').

was ever caught by rod and line, and a break would be almost impossible.

There is nothing more disappointing or trying to the temper than to get a line broken owing to using bad tackle. The man from whom the gut is bought is pronounced to be a swindler, and never to be patronised again, but in the majority of cases carelessness on the part of the angler lies at the root of the evil, and it is not fair to lay the blame on the man who sells the gut, which varies in quality so much that it is quite a chance to get a good hank of it. Good 'made-up' single-gut casting lines can be bought at any of the leading fishing-tackle makers' establishments, but the greatest care should be taken in the choice of one. If there is but one link in the cast of uneven thickness it will be better to put it aside. A cast may be to all appearance perfect, but if the thin end of one of the links is knotted to another which is thicker, there the weak part of the cast will be, and it will be very apt to break at that point. The same care must be taken in making up one's own casting line. Each link should be of even thickness throughout the whole length of the line, and round without a flaw or a scratch. A flat strand, or one which is coarse-looking, should never be used.

If every reasonable care is taken in the selection of a casting line and a fish breaks it, as will occasionally happen to the best of us, the angler has the satisfaction of knowing he has done his utmost to avoid such a catastrophe, and will feel the disappointment far less than if he were conscious a fish was lost through his own carelessness. When a casting line gets worn and ragged, which will probably be the case after two or three months' use, it will be advisable not to trust it. Some of the links may be sound, and may be used in making up another cast, but I would rather not trust them, as it is like mending an old garment with new cloth.

All casting lines should be tested every morning before going out fishing, and also looked over several times during the day. Knots which are often made in casting in foul wind should be taken out whenever they appear, for, if allowed to remain,

there is great risk of a break even with the strongest line. If they cannot be taken out, the link in which they occur should be cut out of the cast and replaced by a new one. The most severe test a casting line can be subjected to is to take an end in each hand and give it a sudden jerk. A line must be very strong to stand this, and unless it is intended to go in for big salmon, when the strongest line is required, such a severe test is unnecessary. In testing a line it is generally thought that if it will stand a strong pull it is sound. This is not to be trusted, and it should be subjected to an additional test as follows :

Hold the line by the forefinger and thumb of each hand about an inch on either side of each knot in succession ; imagine for a moment that the line is a bit of stick or slate pencil, and proceed as if you were trying to break it. If the gut is worn at any of the knots it will knuckle at that point, and it should be cut off and a new knot made ; although it might stand a strong pull, a sudden jerk would generally break it. If the line does not knuckle at any of the knots it may be assumed that it is sound.

Some fishermen prefer a tapered line, which they say will make a neater cast than one of a continuous thickness. This may be very well when fishing in low clear water in summer time, when fine tackle and fine casting are required, but in spring or autumn, or when fishing in a big water, where it is necessary to use the strongest tackle, I should prefer, at the risk of making an occasional clumsy cast, to use a casting line of the same strength and thickness throughout. A tapered line is weakest at the end where the fly is attached to it, and as a line should be as strong, if not stronger, at this point than any other, owing to the connecting knot getting the hardest work, I think a tapered casting line is objectionable, and I will engage to cast quite as neat a line with one of a continuous thickness.

It is not generally known that gut will quickly rot when exposed to a bright hot sun. But this is so. Casting lines, there-

fore, should not be wound round the hat, but put away when not in use ; hanks of gut are best preserved in wash-leather.

It is a common belief that by staining gut it is less easily seen by the fish, but I think this is very doubtful, and I prefer to use it in its natural state.

I have entered into minute details upon this subject, as I think it of great importance. Rod, line, flies, &c., may be perfection in every other respect ; but should there be one weak point in the casting line, the angler may just as well be fishing with rotten thread, and it is absolutely necessary to insure success that he should take such precautions as I have advised.

FLIES.

There is more difference of opinion about salmon flies than upon any other subject connected with salmon fishing. Some people assert that it is necessary to use different patterns of flies for every month during the fishing season ; others, that certain patterns are suitable only for certain rivers, and that it is useless to fish with any others. Another theory is that certain shades of colour must be used on certain days. Every fisherman one meets has his own ideas upon this subject. I have mine, and whether they are right or wrong I will endeavour to explain them. I think it is reasonable to assume that a salmon can discern the colours of a fly ; but will the theorists, who believe that it is necessary to fish with certain patterns of flies in each month of the fishing season, tell me that a feeding fish will refuse a fly which is offered him, say during the month of April, because it is not said to be the pattern of that particular month ? There is not a particle of evidence in support of such a theory, and it is not worth one moment's argument. That certain patterns of flies must be used on different rivers is a more plausible theory, and if the word 'colour' had been substituted for 'pattern' I should be quite of the same opinion. Some rivers are very clear ; others more or less stained with bog water, and from other

causes ; and for this reason flies which are suitable for clear water will not suit peaty or stained water, and local anglers, having found out flies that will kill on their rivers, establish standard patterns, and will use nothing else.

Experience has, however, taught me that if due regard is paid to colour, any other pattern will kill just as well. Local professionals are a very prejudiced class of people as regards salmon fishing, and, if they can help it, will never allow a stranger they are attending to fish with any other than local patterns of flies. If he persists in doing so, and does not know the river, he will as likely as not be put to fish where he will get no sport, and it generally ends by his leaving the flies he has brought with him behind at his fishing quarters and filling up his book with local patterns. If he has sport with these flies, which is very likely to be the case, whatever opinions he may have had before he came, when he goes away he will probably have become impressed with the belief that no other flies were suitable to the river he has fished, and no amount of argument will convince him to the contrary. No doubt that is the reason why so many anglers become converts to this theory.

It may be presumptuous on my part to say I differ from them ; but I have had so many proofs they are mistaken in coming to such a conclusion that I do not hesitate to say so. I have fished a great number of rivers all over the United Kingdom and elsewhere, and I have generally, when not fishing my own water, used local patterns, as it is as well not to fall out with one's attendant, who has it so much in his power to make or mar sport. These flies have generally proved to be killers ; but whenever I have had an attendant who did not understand much about flies, I have always used my own favourite patterns, and have found them just as killing as the local ones.

When I fished the river Wye some years ago, the favourite local fly was made up of a dirty yellow rough body, blue cock's hackle, and the wing of a feather from a bittern's neck. Now all the modern patterns are used, the favourite fly in the spring being the 'canary.' What a contrast !

A friend of mine (a Lee, co. Cork, fisherman) told me not long ago that the fish were beginning to take the Jock Scott in that river ; but the greatest revolution as regards local patterns has been on the river Usk, in Monmouthshire. Formerly the favourite fly used there was made of a dirty yellow body, blue or red cock's hackle, and brown wing. Now, that fly is quite out of date, and the favourite fly—I suppose it may be called a fly—is the 'Usk grub.' Its body is made of tinsel chenille, cock-y-bonddu hackle in joints, and it is certainly a killing fly. Other flies of modern patterns are used, but this is the favourite. This fly was first introduced in the Usk by Mr. G. M. Kelson.

A gentleman considered to be the best fisherman on the Usk, who has fished that river all his life, uses nothing but bodies of flies without wings, made of various colours of seal's fur and mohair, with hackles to match. He never puts on wings, as he says there is no necessity for them, and yet he catches as many fish as anyone else, and often scores when others draw a blank. Two years ago I went with my friend Colonel R—— to fish the Shannon at Killaloe, in the month of April. The river was high at the time, and the gaudy Shannon flies were being used. We had just come from the Blackwater, and had no flies excepting those we had been fishing with on that river. Our boatman had no Shannon flies to spare us, so we were obliged to fish with the Blackwater flies, but were told no Shannon salmon would look at them. The result was—whether it was luck or not—the Blackwater flies beat the Shannon flies, much to the astonishment of our boatman, who accounted for it by saying that the fish were tired of seeing gaudy Shannon flies and wanted a change. Almost every salmon we caught, however, had sea lice upon him, and the fish which were said to be tired of seeing the Shannon flies were in all probability in the sea at the time. I often ask myself the question whether it is the salmon or the angler that has changed his fancy. I am inclined to think it is the latter.

I think I have adduced sufficient evidence to prove that the salmon is not so very particular as to the pattern of fly, and

it is my belief he will take a fly of any pattern when he is in the humour, provided it is of a proper size. Size has more to do with success than all the patterns of flies ever invented. Even if a fly is of the right colour too 'big' a salmon will not take it. He may rise at it, and probably get 'rugged' and will then be seen no more. The choice of a fly of suitable size is a very important matter, but I will allude to this hereafter.

I now come to the question of certain shades and colours being more suitable than others upon certain days. I have no doubt a salmon will occasionally prefer a fly of a certain colour to any other, although I do not admit he would refuse to take a fly of another colour, when he is in the humour, if it were offered to him. I remember upon one occasion watching a cross-line at work upon the Blackwater, when I noticed one fly take fish after fish, all the others, eleven in number, failing to rise one. I cannot think this was accidental; probably the appearance of the fly, under a peculiar condition of light, was the attraction. Whether the fish would have taken any of the other flies if that particular pattern had not been upon the cross-line I cannot say, but I am inclined to think, from what I know of their habits, they would have done so.

If it is taken for granted that a salmon prefers a fly of one colour to another upon certain days, the difficulty is to find out the right colour, and I think a great deal of time would be wasted in the endeavour to do so. All we can do is to select the fly we fancy will take, and if it is of the right size, and if any fish are on the move, we are not often disappointed. There are certain facts, however, which, to a certain extent, may guide us in the choice of a fly. I have tried the experiment of holding up flies of different colours against the sky, putting myself in the position a salmon would occupy with regard to each fly as it was held up. The result was that, with a bright blue sky as a background, I could see every colour fairly well, with the exception of light blue and a jay hackle, which I could not distinguish. With an overcast sky as a background, and a clear atmosphere, I could

see all the colours much plainer, and more distinctly in proportion as the background was darker. If I held up the fly in a room, I could distinguish the colour of almost every fibre in the fly, but when it was dark a white fly was seen plainer than any other colour.

There were certain conditions of sky and atmosphere, however, when I was puzzled to distinguish the colours. If the sky was not wholly overcast, and there was a great glare caused by the sun shining through the broken clouds during the summer months, and on a dull heavy day, with a dark murky atmosphere, I could not tell one colour from another, but I could tell whether it was dark or light. In all states of the background I could distinguish black and red better than any other colour, and if it is taken for granted that a salmon can see a fly as we do, when it is held up to the light in the manner I have explained, it may assist us in the choice of a fly as regards colour.

In clear water, on a bright day, a fly composed of red or black, being decided colours and easiest seen, might scare a salmon when coming near it, or just about to take it; therefore it may be advisable to use a fly of a neutral or any light colour on a bright day. Upon a dark day, particularly if there is a wind, or should the water be stained after a fresh, as black and red are more distinctly seen, the more likely are they to attract a salmon's attention than a neutral colour, and in such a case I should say that a fly with a black or dark body would be most suitable. It must, however, at best be only guess-work. Large, gaudy flies, such as are used on the Shannon, are not suitable for ordinary-sized rivers, and are only good for fishing in deep rapids of big rivers, where they are more likely to attract the attention of fish than flies of more sombre or neutral colour.

In a deep and rapid stream a black or red fly, of a proper size, will be more likely to attract a salmon's attention than any other colour. Whether he would take a fly body, hackle, and wings all black, I am not prepared to say, but I have taken

numbers of salmon with a red fly, and find this colour do well in a big water, particularly if stained after a fresh. Although big, gaudy flies are only suitable for big rivers, I see no reason why they should not kill as well as any other pattern upon smaller rivers, provided they are made of a suitable size. I have said success greatly depends upon the size of the fly used, and to judge the proper size is a most important part in the art of salmon fishing.

On arriving at a river's bank the angler should carefully examine the pool he is about to fish, so as to ascertain the colour and depth of the stream, and whether it is rapid or smooth running. If it is deep and rapid, or stained after a fresh, a large-sized fly should be used, and a smaller one in proportion as the stream is clear or shallow. The state of the sky must also be taken into consideration. In spring and autumn salmon will take much bigger flies than in the summer time. A fly that would be called big in summer will appear almost a midge in comparison to the smallest flies generally used in early spring or autumn. If the water, however, should be very low, even in spring, it will be necessary to use a very small fly, according to the size of the water. It is impossible to lay down any hard-and-fast rule for selecting a suitable fly. The art of doing so is only acquired by long experience, and the best of us are often at our wits' end to know what fly to select.

When a man is seen constantly changing his fly it is certain that sport is bad, and fish not on the move. It is possible, but very improbable, that a change of fly will change the humour of the fish. I have myself changed flies hundreds of times, but have never known it to answer when fish are sulky; a change, however, after a fish has risen is very often successful. It is a common saying that fish get tired of the sight of flies, and become shy by being much fished over; but if my experience can be taken as evidence, I rather incline to the opinion that it is the fisherman who gets tired of throwing his fly over the fish, rather than the fish that get tired of seeing it.

I was fishing in the Lyngdal, in the south of Norway, with

my friend T. F.—the water was very low, and we could see from rocks overhanging every salmon in the pools. At the bottom of a pool celebrated for fish taking the fly, we saw four salmon lying close together. The pool was, I should say, ten feet deep. I scrambled down the rocks to where I could cast my fly over them. My friend stood above watching my proceedings. After about six or seven casts over the fish, he said, 'When your fly was in a particular position, one of the salmon seemed to get uneasy and shifted his position a trifle.' This happened two or three times, until at last the fish could not stand it any longer, and took my fly, but I had the bad luck to lose him after a hard fight.

Upon another occasion, when a little farther down the river, I was standing upon a rock watching my friend fish, where I could see everything which was going on. The water was high but very clear, and nearly a dozen times running I saw a fish rising to the fly whenever it came to a particular part of the stream, but he did not attempt to take it, and did not approach nearer to it than at least a foot. The sun was shining on the pool at the time, and thinking it was of no use trying any more until sunset, we waited until the sun had disappeared behind the hills. Afterwards, the very first cast my friend made he hooked the fish and landed him.

These are the only two occasions on which I have had the chance of knowing what has taken place below the surface of the water while a pool was being fished over, but after what I saw I cannot quite believe a fish gets scared by seeing too many flies. I have no doubt many a fish which we know nothing about comes 'shy' at a fly in the manner I have stated. We leave the pool we have perhaps fished the whole day blank in disgust, yet it often happens another fisherman takes possession of it, and hooks a fish before we are out of sight. What can be more aggravating than this? Yet there are few of us who have not had our tempers thus tried.¹

¹ In 1879 in July, about 6 A.M., I was first on the water on the Ristigouche, fishing down, at Metapedia, in a canoe. I had on 'Jock o' Scott.' I did not

Fly tying is a very important part of the art of salmon fishing, and doubtless to be able to tie one's own flies enhances the pleasure of the sport. I have heard it said that a man cannot rank as a first-class fisherman unless he can do so ; but I think this is hardly fair. Many people's fingers are 'all thumbs,' and they could not tie a fly in a year of Sundays, as the saying goes ; other salmon fishers are professional men, and have no time to spare from their duties. These may be first-rate fishermen, although not able to tie a fly, and would loudly protest against being placed in a secondary position on this account. It might just as well be said that to rank in the first class a fisherman should be able to make his own rods and reels, yet there is not one in a thousand that can do so. Fly tying is a most interesting, and I might almost say exciting occupation, and many a dull rainy day, during the winter months especially, may be thus pleasantly, and as far as salmon-fishing matters are concerned profitably, passed. Doubtless a man will feel much prouder when he has landed a fish with a fly of his own making, than with one he had bought, and I would recommend every fisherman who has the time to spare to try his hand at it.

In selecting bought flies care should be taken to ascertain that they are firmly tied. A fly that is to all appearance perfect, may when used a short time come to pieces, and it will probably be found that this is in consequence of no varnish having been applied when finishing off at the head. It is necessary this should be used to make the wings sit firmly and keep their position. This can always be tested in the following

get a rise. I had just reached the railway bridge when an American gentleman asked what fly I was using. I told him. 'I have the same,' he replied, and fished down the pool behind me. He, about the sixth or seventh cast, hooked a 23-lb. fish, which he killed some way down below me, I pulling out of the way to let him pass. Immediately behind him another American gentleman came. Within half a dozen casts he hooked a fish. As he passed I asked what fly ? 'Jock o' Scott,' he replied. Away he went in his canoe and killed a twenty-three pounder also. I did not get a rise in the pool, and had fished over the two fish they killed. They were both novices, and had not either of them killed six fish in their lives !—ED.

manner. Hold the bend of the hook between the forefinger and thumb of the left hand, and the head, where the wing is attached, in those of the right hand. If the wing is firmly put on it cannot be moved, but if the fly is badly tied the wing can be shifted with ease right and left at an angle to its proper position, in which case it should be discarded. Bought flies are generally made with too much feather in the wing ; this is a great mistake, especially in the case of a mixed wing. If the wing is too heavy the fly cannot work properly ; every fibre of a mixed wing should be separate in the water, and, if the angler does his work properly, made to assume a natural and life-like appearance. The loop also of a fly should be carefully examined. It should be made of stout single or treble gut, and on no account of thin gut. I prefer making loops of two pieces of single gut to treble gut, as I think the latter is more apt to fray the casting line where it is fastened to it. Loops should always be tested by giving them a strong pull.

It should be borne in mind by the maker of a fly, be he professional or amateur, that not the least important part of his work is to securely fasten the loop to the shank of the hook. If this is neglected all the precaution the angler may have taken will have been in vain. Before a fly is used the temper of the hook should be tested by holding the shank between the forefinger and thumb, and having inserted the point in a piece of soft wood, giving it a moderately hard pull. A hook that will stand this test may be trusted.

HOOKS.

There are many different shapes of hooks, each of which has its advocates, but I have not yet come to any conclusion as to which is best to use.

Opinions are often formed according as the fish take badly or well. Supposing a man to have fished for a week with a Limerick bend, when salmon were rising badly, and he lost a

large proportion of the fish he hooked, he would condemn the Limerick hook and try another description of bend, say a sproat; with this he might fish all the succeeding week when salmon were taking well, and lose hardly a fish. He would then adopt the sproat and say there was no hook like it, and he would fish with it until he again came across fish that were rising badly, when the sproat in its turn would be condemned and perhaps the Limerick again adopted. He would thus go on changing from year to year, never being able to give a decisive opinion as to which is best to use; and that is precisely my case. If, however, I have a preference for one shape over another, I would take the Limerick, as I think a fly looks better when dressed in this shape than in any other.

With regard to patterns of flies, my favourite is the Jock Scott, and if I were told that I was only allowed to fish with one pattern that is the one I should choose; but in any case, with half a dozen flies in addition of different sizes and colours, I should be quite content to go on a fishing expedition and would engage to hold my own. Many salmon fishers, however, prefer a larger selection, and the following list of some of the most popular standard patterns may perhaps assist them in making their choice.

The selection has been made to embrace flies which are all more or less *general*—suitable, that is, to the generality of rivers—rather than those having a comparatively restricted range, however popular and successful they may be in particular localities.

The 'descriptions' of and remarks about all but a few of the last flies are by Mr. George M. Kelson, who has made the question of salmon flies and their dressing a special study.



THE 'JOCK SCOTT.'

Tag: Silver twist and light yellow silk.

Tail: A topping and Indian crow. *Butt:* Black herl.

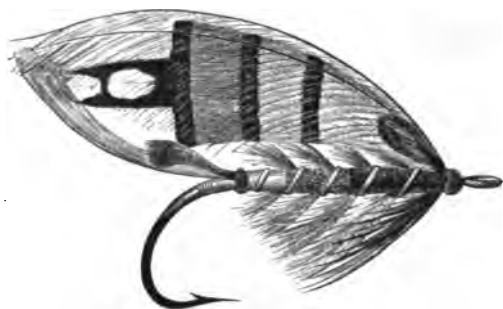
Body: In two equal sections, the first light yellow silk ribbed with fine silver tinsel; above and below are placed three or more toucan's according to size of hook, extending slightly beyond the butt and followed with three or more turns of black herl. The second half black silk with a natural black hackle down it and ribbed with silver lace and silver tinsel. *Throat:* Gallina.

Wings: Two strips of black turkey with white tips, below; two strips of bustard, and grey mallard, with strands of golden pheasant tail, peacock (sword feather), red macaw, and blue and yellow dyed swan over; having two strips of mallard and a topping above.

Sides: Jungle fowl. *Cheeks:* Chatterer. *Horns:* Blue macaw. *Head:* Black herl.

No one will dispute that Jock Scott, when dressed correctly, is the most remarkable of all our standard patterns, and therefore entitled to the precedence it has been here accorded. It is probably the best known fly that 'swims' throughout the length and breadth of the three kingdoms, and indeed it would hardly be an exaggeration of language to say that this splendid specimen of artificial entomology has won an almost superstitious veneration amongst salmon anglers.

Whether used in rushing streams or rapids, or in still, sluggish, oily pools, its appearance seems to be equally attractive and its success assured. It was invented by the late Lord John Scott's water bailiff some forty-two years ago.



THE 'DURHAM RANGER.'

Tag: Silver twist and light yellow silk.

Tail: A topping and Indian crow.

Butt: Black herl.

Body: Two turns of orange silk, two turns dark orange seal's fur ; the rest, which is about half, black seal's fur.

Ribbed: Silver lace and silver tinsel.

Hackle: From orange seal's fur, a white coch-y-bonddu dyed orange.

Throat: Light blue hackle.

Wings: Four golden pheasant tippets overlapping, as illustrated, and enveloping two projecting jungle fowl back to back ; and a topping.

Cheeks: Chatterer.

Horns: Blue macaw.

Head: Black Berlin wool.

The Durham Ranger owes its origin to James Wright, the famous fly dresser of Sprowston, near Kelso ; and its name to the circumstance of its being first successfully tried, some twenty years ago, on the Sprowston water by a party of gentlemen from Durham, to whom it was let at the time.

This was the christening of the Durham Ranger, one of the very best of bright flies, and one that in open pools and bright weather, no matter what the river, rarely fails if not mounted too large. Indeed, as a rule in regard to flies generally, I have often noticed that failure, particularly with gaudy patterns, is due to the fly being disproportionately large or small.



THE 'CHILDERS.'

Tag: Silver twist and light blue silk.

Tail: A topping with strands of red macaw, powdered blue macaw, and pintail.

Butt: Black herl.

Body: Two turns of light yellow silk continuing with light yellow seal's fur, leaving one-fifth at the shoulder for scarlet seal's fur.

Ribbed: Silver lace and silver tinsel.

Hackle: A white furnace hackle dyed light yellow.

Throat: A scarlet hackle and light widgeon.

Wings: Golden pheasant tippet and tail, turkey, silver pheasant, pintail, summer duck, bustard, powdered blue macaw, parrot, red macaw, and gallina, with two strips of mallard above and a topping.

Horns: Blue macaw.

Cheeks: Chatterer.

Head: Black herl.

This fly is an old favourite, having been introduced about the year 1850. Dressed large or small it kills well in any part of the three kingdoms. Originally Colonel Childers, who was the inventor, 'formulated' this fly without a topping, but there is some justification for the addition of one, as, to use his own words, he 'always put one when he could get it.' The black 'list' down the centre of the hackle has a very telling effect in the water.

It is as well to note that 'turkey,' unless when otherwise indicated, means the brown mottled feather.



THE 'BUTCHER.'

Tag: Silver twist and dark yellow silk.

Tail: A topping, teal, and powdered blue macaw. *Butt*: Black herl.

Body: In four equal divisions—beginning with light red-claret, and continuing with light blue, dark red-claret, and dark blue seal's furs.

Ribbed: Silver tinsel (preceded on large hooks by silver lace).

Hackle: Natural black, from light red-claret seal's fur.

Throat: Yellow hackle and gallina.

Wings: One tippet feather, and a breast feather from the golden pheasant, back to back, tied edgeways as illustrated, the points of the breast feather extending to the length of the wing. Both well covered on the side with slight strips of teal, golden pheasant tail, gallina, bustard, and peacock wing; with strands of parrot and swan dyed yellow, and with two strips of mallard at top.

Horns: Blue macaw. *Cheeks*: Chatterer. *Head*: Black herl.

Measured by the standard of antiquity the Butcher is entitled to the first place in our list of standard flies. Its claim to seniority would probably be admitted by a jury of fly fishers *nemine contradicente*. I can trace it back to the first fountain head. In its infancy it went by the name of Moon's Fly, and was the invention of Mr. Jewhurst, of Tunbridge, Kent. About the year 1838 it was re-christened at Blacker's establishment, from which date it became a popular favourite, and no standard pattern has undergone less change of *toilette* whilst still retaining its high reputation everywhere.

It is very much more effective when the outer wing-coverings are arranged to 'veil' the tippet and breast feather, so as not to form a confused mass at the top, as is the case with carelessly dressed specimens.



THE 'POPHAM.'

Tag: Gold twist.

Tail: A topping and Indian crow.

Butt: Black herl.

Body: In three equal sections butted with black herl. The first dark red orange silk, ribbed with fine gold tinsel having Indian crow above and below, as illustrated; the second, or middle joint, yellow silk with similar ribbing and crow's feathers as before; the third light blue silk and silver ribbing, with the Indian crow repeated.

Hackle: At the throat only, jay.

Wings: Tippet, teal, gallina, golden pheasant tail, parrot, light brown mottled turkey, bustard, red macaw, yellow macaw (swan dyed yellow instead of yellow macaw for large sizes), with two strips of mallard above, and a topping.

Cheeks: Chatterer.

Horns: Blue macaw.

Head: Black herl.

This fly retains, and—if a prophecy be admissible—will continue to retain, its high reputation on many of our best salmon rivers. The combinations in the body are, in my opinion, absolutely free from blemish, and reflect great credit upon the inventor, a dexterous and persevering fisherman who has given his name to the fly, and who is further known as the winner of the Derby in Wild Dayrell's year. Another variety was introduced by the late Mr. John George Children, of Halstead Place, but the original here given is not only considered better, but is certainly more popular. The great mistake generally made is in overlaying the body with too many Indian crow's feathers.



'THUNDER AND LIGHTNING.'

Tag : Gold twist and yellow silk.

Tail : A topping.

Butt : Black herl.

Body : Black silk.

Ribbed : Gold tinsel.

Hackle : From first turn of tinsel, orange.

Throat : Jay.

Wings : Mallard, in strips with a topping.

Sides : Jungle fowl.

Horns : Blue macaw.

Head : Black herl.

This—another creation of the redoubtable James Wright—is, in my estimation, as a clear-water fly, the best that he has ever invented. It is a well-recognised fact that salmon 'take' better just as the water is beginning to rise after rain, and in such conditions—without detracting in any way from its merits under other circumstances—I know of no fly that can be recommended in preference. It is not, however, a pattern that I should select when a river is at all inclined to be muddy; but in heavy rains and boisterous weather it is the one of all others entitled to a patient trial. In fact, to perpetrate a mild joke, 'Thunder and Lightning' is the natural accompaniment of a storm.



THE 'SILVER GREY.'

Tag: Silver twist and yellow silk.

Tail: A topping, unbarred summer duck, and two strands of blue macaw.

Butt: Black herl.

Body: Silver tinsel (flat) ribbed with silver tinsel (oval).

Hackle: From first turn of ribs, a silver-white coch-y-bonddu.

Throat: Light widgeon.

Wings: Silver pheasant, bustard, golden pheasant tail, pintail, powdered blue macaw, gallina, swan dyed yellow; two strips mallard above, and a topping.

Sides: Jungle fowl.

Horns: Blue macaw.

Head: Black Berlin wool.

The Silver Grey, another of the Sprouston list, also by James Wright, is a very old and well-established pattern.

I have cast this fly for years with considerable success in all kinds of pools and corners, and it seems to be equally effective either in bright or dull weather, in open or shaded places. In rivers where the fish are proverbially sulky it is a great favourite, and I have one or two instances recorded of its success in out-of-the-way districts 'where no fishers abide.' The Silver Grey makes a capital change with the Lion—the two most valued silver-bodied flies in general use. Many anglers are shy of tinselled bodies, but either of these patterns can be safely recommended, and, the question as to size being correctly estimated, exceptional sport is frequently obtained with them.



THE 'LION.'

Tag: Silver twist and light yellow silk.

Tail: A topping.

Butt: Black herl.

Body: Silver tinsel (flat) ribbed with silver tinsel (oval). One fifth part being left at the shoulder for dark scarlet seal's fur.

Hackle: Natural black, three parts down the body.

Throat: Gallina.

Wings: Commencing with a few fibres of tippet, sword feather of the golden pheasant, and peacock herl. Yellow macaw, red macaw, bustard, golden pheasant tail, teal, gallina; with two strips of mallard above, and a topping.

Sides: Jungle fowl.

Horns: Blue macaw.

Head: Black Berlin wool.

The Lion, as already mentioned, is another exceptionally good silver-tinselled pattern. Some of our most distinguished fly-fishers adduce an imposing array of facts and arguments in its favour, and whatever local opinions may be, anglers will do wisely to give it a trial. When the water is slightly stained, it is, perhaps, a little more attractive than the Silver Grey, and may be used with advantage one size smaller, speaking comparatively, the materials in the dressing being more conspicuous. In the event, however, of one or two downright refusals, the Jungle—which cannot be too black and white as a rule—should be nipped entirely off. The Lion is another invention of James Wright.



THE 'CAPTAIN.'

Tag: Silver twist and light blue silk.

Tail: A topping and chatterer.

Body: Two turns of light orange silk, two turns dark orange seal's fur, two turns dark red-claret seal's fur, and finish with dark blue seal's fur.

Ribbed: Silver tinsel.

Hackle: A white coch-y-bonddu dyed light red-claret, from the orange silk.

Throat: Blue hackle and gallina.

Wings: Pintail, teal, gallina, peacock wing, Amherst pheasant, bustard, and golden pheasant tail; swan dyed light orange, dark orange, dark claret, and dark blue; with two strips mallard above, and a topping.

Sides: Jungle fowl.

Horns: Blue macaw.

Head: Black herl.

The Captain is one of my own patterns, and was introduced by Bernard, of Church Place, Piccadilly, with another of mine called the Champion, many years ago. But it has long since adopted the name of the Poinder in Scotland, and is perhaps better known there by that erroneous appellation.

It is rather difficult to recommend this fly without appearing to blow my own trumpet; at the same time I shall probably be justified in saying that as a general pattern it holds its own everywhere. I have had good sport with it dressed in all sizes and very rarely meet with disappointment, especially as a change when the Durham Ranger, for example, has moved a fish. It should be dressed very small for lakes or shallow streams.



THE 'BLACK JAY.'

Tag: Silver twist and dark yellow silk.

Tail: A topping.

Butt: Black herl.

Body: Two turns black silk ; the rest black seal's fur.

Ribbed: Silver tinsel, preceded by silver lace for large patterns.

Hackle: Natural black from silk.

Throat: Jay.

Wings: Tippet, scarlet ibis and gallina ; golden pheasant tail, bustard, teal, black cockatoo's tail, and swan dyed green and dark yellow ; with two strips mallard above.

Horns: Blue macaw.

Head: Black herl.

A complete contrast to the preceding series is the Black Jay, a pattern for the introduction of which I am also responsible, and which has been in general use for more than a quarter of a century, though invented long before that. Unlike the rest of the 'jays' it will be found most useful in dark water, and although it kills well dressed small, it shows perhaps a more marked superiority when tied on very large hooks. I then generally add jungle to the wings and a topping.

There are numerous imitations of this fly, all varying trivially in minor details ; but I think the formula here given will be found satisfactory upon hooks up to an inch and a quarter in length, without any alteration or addition.



THE 'CLARET JAY.'

Tag : Silver twist and light yellow silk.

Tail : A topping, scarlet ibis, and gallina.

Butt : Black herl.

Body : Two turns light red-claret silk, the rest claret seal's fur.

Ribbed : Silver tinsel.

Hackle : Claret.

Throat : Jay.

Wings : Teal, tippet, and florican ; light mottled turkey, parrot, golden pheasant tail, gallina, and dark bustard ; swan dyed light yellow, yellow-green (or powdered blue), yellow and claret ; with two strips mallard above.

Sides : Yellow macaw and ibis, in married strips.

Horns : Blue macaw.

Head : Black herl.

The Claret Jay is the best known and most popular of the 'jay set.' In rivers where medium-sized flies are used the 'Claret,' as it is generally termed, kills as well as anything. There is one variety of it that may be mentioned having yellow seal's fur instead of light red-claret silk on the body, but the description given is that of the original dressing.

These three sombre patterns—the Black and Claret Jays and the Dirty Orange—are more suitable for medium-sized rivers, and although they are rarely tied on very large hooks, there are plenty of flats, streams, nooks, and corners in our largest rivers where I am satisfied they could be tried with considerable success on hooks up to, say, No. 2.



THE 'DIRTY ORANGE.'

Tag: Gold twist and light blue silk.

Tail: A topping and tippet.

Butt: Black herl.

Body: Two turns light orange silk ; the rest light dirty orange seal's fur.

Ribbed: Gold tinsel.

Hackle: Light dirty orange from silk.

Throat: Jay.

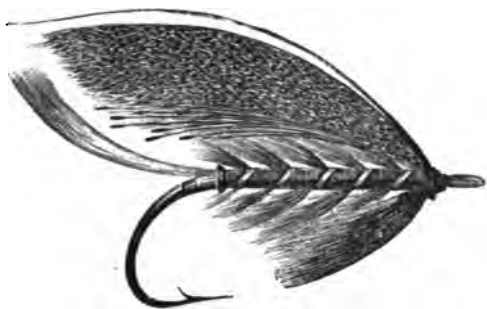
Wings: Ginger turkey, gallina, and strands of breast feather of golden pheasant ; bustard, peacock herl, golden pheasant tail and strands of black turkey with white tips ; red macaw, swan dyed dirty orange and dark blue, with two strips of mallard above.

Sides: Summer duck.

Horns: Blue macaw.

Head: Blue herl.

Another of the Jays, and also a popular favourite, is the Dirty Orange. Salmon fishers, and novices more especially, are often so eager to try every imaginable novelty that makes its appearance in the way of flies that they are unconsciously apt to neglect the more quietly dressed but well-established patterns. So far as appearance goes, there are doubtless many patterns more taking, but I have included this and the two preceding flies in my standard list advisedly, believing that in the long run they will be found to justify the selection.



THE 'FIERY BROWN.'

Tag : Gold twist and light orange silk.

Tail : A topping.

Body : Fiery brown seal's fur.

Ribbed : Gold tinsel.

Hackle : From first turn of tinsel, fiery brown.

Wings : Tippet strands between broad strips of mallard.

Horns : Blue macaw.

Head : Black herl.

N. B.—There is also another variety by the inventor (Michael Rogan), having a blue hackle alongside the fiery brown hackle down the body.

The Fiery Brown, facetiously termed 'The All Ireland Fly,' is gradually becoming more popular elsewhere, and many a victory won in 'despite of fate' may be credited to this singularly attractive yet plain-looking pattern. Indeed, however unpropitiously the campaign may appear to be going, Michael Rogan's ingenious offspring will very likely retrieve the situation, whether the *champ de bataille* be in the north or south, in pool, stream, or rapid. Rogan's mode of dyeing the seal's fur and hackles is most successful, and far superior to all others for securing the fierce flame-like tint desired.

The Fiery Brown is another fly that seems to answer best when dressed on medium-sized hooks, though I have never tried it, or even seen it tied very large.



THE 'SPRING GRUB.'

Tag: Silver twist and light blue silk.

Tail: Scarlet ibis and blue macaw in married strips.

Body: In two sections having three hackles as illustrated: in the place of the butt.

Butt: A furnace hackle dyed orange. The first half of the body yellow silk ribbed with black chenille.

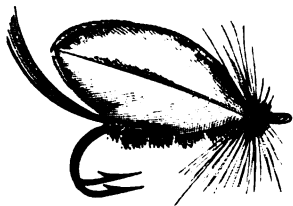
In the centre is placed a natural blue hackle. The second half of the body black silk ribbed with silver tinsel, and the shoulder, or head hackles, a natural coch-y-bonddu, and a gallina dyed dark orange.

This is one of my earliest of the scorpion tribe, and belongs to a numerous collection of wingless flies which are coming more and more into fashion. There are times when fish require a good deal of coaxing, and on many days they will rise in pool after pool merely, as it were, for the sake of inquisitiveness. Upon these occasions especially I make it a rule to tone down the colours by mixing them with deeper shades, and dress then and there a fly of this description, if, that is, I do not happen to have a suitable one by me. The pattern here given I have often found a good change with Excelsior, Jock Scott, &c. I have found these wingless 'nondescripts' kill well wherever I have fished, and every standard fly should, I believe, be partially imitated in a similar fashion.

The '*Spring grub*' completes the list of general standard flies, with one or other of which, from the beginning to the end of the season, and in any part of the United Kingdom, salmon are to be killed if at all.

[NOTES BY THE EDITOR.]

To Major Traherne's capital selection of standard flies I should be disposed to add half a dozen patterns which in my own experience I have found to be generally 'good killers' on the salmon rivers of the United Kingdom. The descriptive formulæ of these flies are by Mr. Charles Farlow, 191 Strand.



THE 'BEAUFORT MOTH.'

Tag: Gold tinsel; *Tail:* Golden pheasant topping; *Body:* Bronze peacock herl, ribbed with gold tinsel; *Hackle, Throat:* Red cock's (throat hackle only); *Wings:* Two small white hen feathers; *Head:* Peacock herl.

This fly will be found very useful during the last hours of daylight if fish are shy. It has never failed to kill on any river on which it has been tried in England, Scotland, Ireland, Wales, Canada, and Labrador.



THE 'SILVER WILKINSON.'

Tag: Gold twist; *Tail:* Golden pheasant topping; *Butt:* Scarlet wool; *Body:* Silver tinsel, ribbed with gold twist; *Hackle:* Pale blue run down body; *Throat:* Jay; *Wings:* Fibres of golden pheasant tail, bustard, widgeon, golden pheasant tippet, dyed red swan, topping over all; *Horns:* Blue and yellow macaw; *Head:* Scarlet wool.

An excellent fly for salmon on a bright day. Sometimes when the

'Silver Doctor' fails the spotted jungle cock wing appears to exercise an attraction; but it is a killing fly in any river.



THE 'BLACK FAIRY.'

Tag: Gold twist and golden yellow floss; *Tail*: Golden pheasant topping; *Body*: Black wool ribbed with gold twist; *Throat*: Black cock's hackle; *Wings*: Brown mallard; *Head*: Black ostrich herl.

As universally killing a fly as even Jock of Scot. I prefer it on a dark day; other people fancy it on a bright one.



'CRITCHLEY'S FANCY.'

Tag: Silver twist and pale blue floss silk; *Tail*: Golden pheasant topping and fibres of golden pheasant tippet; *Body*: Pale orange floss silk ribbed with silver twist; *Hackle*: Orange run down body; *Throat*: Teal; *Wings*: Fibres of teal, dun turkey, and red macaw; *Horns*: Blue and yellow macaw; *Head*: Black ostrich herl.

This fly was the only one at which fish would rise in the Ristigouche river at the end of June and beginning of July 1879, and Mr. Critchley, who alone did any good on the water at the time, was kind enough to give me some of his patterns. The Ristigouche runs between Lower Canada and New Brunswick.



THE 'LEMON-TIPPED GREY MONKEY.'

Tag: Silver twist and yellow floss ; *Tail*: Golden pheasant topping ; *Body*: Grey monkey fur ribbed with silver oval ; *Hackle*: Green olive run down body ; *Throat*: Yellow hackle ; *Wings*: Fibres of brown mallard, golden pheasant tippet, golden pheasant tail, bustard, guinea fowl, and green parrot ; *Horns*: Blue and yellow macaw ; *Head*: Black ostrich.

A very useful fly. When there is not sun enough to make the 'Silver Grey' sparkle this pattern is often very killing.



THE 'GREEN GROUSE' AND THE 'BLUE JAY.'

'GREEN GROUSE.'—*Tag*: Silver twist and medium orange floss silk ; *Tail*: Fibres of magenta and pale blue dyed swan and golden pheasant tippet ; *Body*: Light green floss silk ribbed with silver tinsel ; *Hackle*: Grouse run down body ; *Throat*: Blue jay hackle ; *Wings*: Fibres of silver pheasant, brown mallard, red macaw, and golden pheasant tippet ; *Head*: Black ostrich herl.

'BLUE JAY.'—*Tag*: Silver tinsel ; *Tail*: Golden pheasant topping ; *Butt*: Black ostrich ; *Body*: Medium blue floss silk ribbed with silver tinsel ; *Hackle*: Blue jay half way down body ; *Throat*: Yellow hackle ; *Wings*: Fibres of bustard, golden pheasant tippet, green parrot, dyed purple swan, and guinea fowl ; *Head*: Black ostrich herl.

The Green Grouse, and the Blue Jay, are the two best flies for the Blackwater, co. Cork, Ireland.

BEAUFORT.]

CASTING.

I have so far given all the information I can think of that may be of use as a guide to the selection of the principal requisites for an outfit for salmon fishing. There are, however, several other articles to make it complete, such as fly books, tin boxes, &c.; but these do not require any mention in detail, and, as they will not make or mar sport, the choice of them may be safely left to the angler's fancy.

The first thing a beginner has to learn is, how to cast overhand, and he should commence work with a short line, say from ten to fifteen yards. When he can make a tolerable cast with this length, he may gradually lengthen the line; and if he perseveres and works upon a sound principle, and has provided himself with a rod suitable to his powers of casting, he will gradually become master of it, and be able, with tolerable ease, to cast a line of twenty or twenty-five yards, which is as far as will be required for general purposes. To make a clean cast overhand, it should be borne in mind it is necessary that the line be lifted out of the water to the very end to where the fly is attached; and that it should be thrown to its fullest extent in the backward cast (that is, behind the angler's back) prior to the forward cast being made. If this be neglected, the fly will as often as not be cracked off, and the line sent out in a slovenly corkscrew fashion, or else both line and fly will fall in a heap together in the water, the disadvantages of which will be explained later on. To make a cast in a workmanlike manner the line should be sent clean out, down, and across stream at an angle of not less than 45° (see D E, fig. 1). As soon as the fly touches the water, the rod, supposing the angler to be standing at A, should be held in the position A D at an angle of about 10° down stream from a line taken from where the angler stands straight across to the opposite bank, and it should remain in that position until the fly has reached mid-stream, G, after which the point should gradually follow the

direction of the fly, H, until the cast is completed, A B K, which will bring the rod into a favourable position, A B, to make a fresh cast ; the dotted line, E F G H K, marks the course of the fly from beginning to end of the cast. The advantage of making the fly work in the manner I have explained is that every fibre of the wing and hackle will be in their right position ; it will assume a natural, lifelike appearance ; and, owing to the slow rate and direction it is travelling, every fish in the pool will have

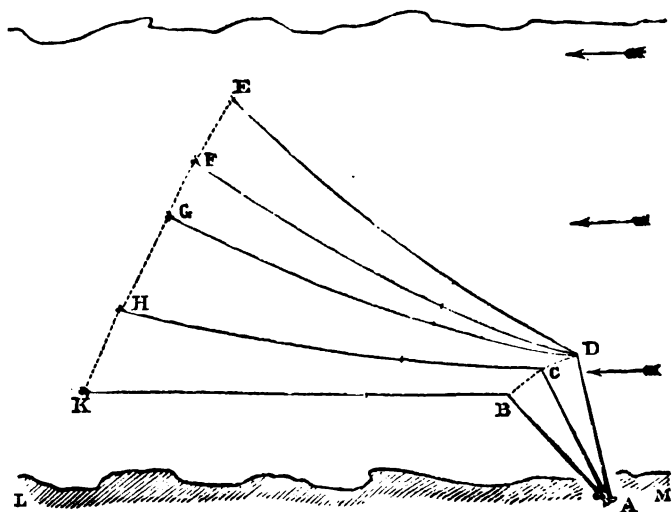


FIG. 1.

a fair chance of discerning its colour ; and if he rises, he will be more likely to be well hooked than by any other method.

If the stream is of even rapidity from bank to bank, it will be a comparatively easy matter to make the fly work in the manner I have explained ; but should the stream run more rapidly at the middle than at the sides, which is generally the case, a 'belly' in the line must necessarily be made as soon as the line touches the water. If this is allowed to remain, the

fly cannot work as it ought to, which will be explained in the diagram, fig. 2. *AB* represents the rod, supposed to be in angler's hands standing at *A*. *BC*, the line cast, as it should be, down and across stream. *BD* represents the belly made in the line, which will increase, *DEFGH*, until the cast is completed at *LK*, the point of the rod meanwhile being shifted from *B* to *L*.

The disadvantages of a fly working in the manner I have

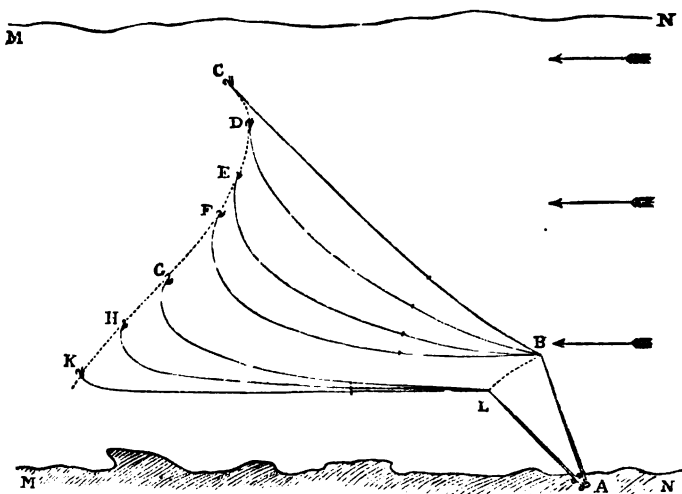


FIG. 2.

shown when a fish rises, are, I think, obvious ; and I will explain this more fully in describing a straight-across cast.

There is a way of taking the belly out of a line, which was taught me by an old fisherman when fishing the Kirkcudbrightshire Dee in my younger days. I dare say many of my readers will recollect old Jemmy Gordon, professional salmon fisherman at Kirkcudbright, who was called the 'Emperor,' and right well he deserved the title, for he knew more about salmon fishing than any professional I have ever met, and I acquired a

store of knowledge from him that I have found useful ever since. He is dead and gone now, and the like of him I shall never see again. It was Jemmie that pointed out to me the evil of allowing a belly to remain in my line, and who taught me how to rectify it.

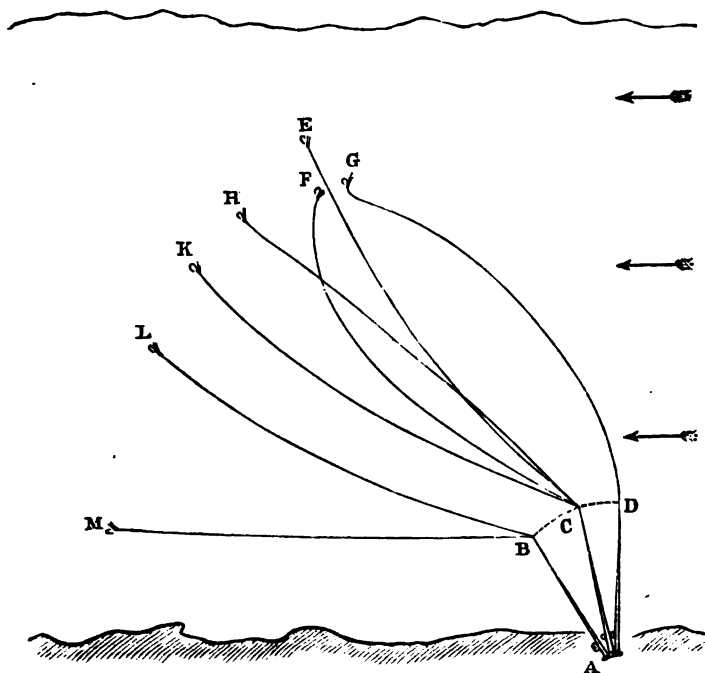


FIG. 3.

To accomplish it is a knack which can only be acquired by practice, but I think it of such importance that I will endeavour, by the aid of the diagram, fig. 3, to explain how it is done.

AC represents the rod and CE the line—as first cast, in correct position. CF represents the belly, almost instantly made. By making a back-handed upward cast, the belly, CF, the outward

curve of which is facing down stream, is changed in its direction to D G ; the outward curve facing up stream, the position of the rod being shifted from c to D the action of the stream will then straighten the line, which will gradually get into the position c H, the position of the rod being shifted back to A C ; the fly will then work gradually across stream, the rod following the direction of the fly until the cast is completed at A B M. Few fishermen I have watched fishing take the trouble to take the belly out of their line, and are content to let the fly work in the same position as it was cast ; but if they would look at it in the light I see it, I feel convinced they would be of my opinion.

Many experienced fishermen advocate casting straight across stream, and assert that by adopting this method many more fish are risen than by any other ; they may be right, but I much doubt it, and maintain that, even should more fish be risen by the straight-across method, more fish are killed by casting down and across.

A reference to diagram, fig. 4, will show how a fly works cast straight across stream, A B C, from the time the fly touches the water at c to when the cast is completed, A B E. The course of the fly is represented by the dotted line c D E ; the position of the rod cannot be altered, as it would make matters worse. It will be seen that the fly is travelling from first to last head foremost down stream, the cross action of the stream on the fly will put all its feathers out of gear, the fish in the pool will get but a momentary sight of it, and will have no time to discern its colour, and if they rise at it, by the time they reach the surface of the water the fly will be a yard behind them down stream, and the disappointment thus caused will be apt to scare them to such a degree that they will not rise again.

That fish are thus caught I do not deny, but I maintain that many more are caught by adopting the down and across cast.

Figs. 5 and 6 are diagrams representing the two slovenly casts I have before alluded to. In both diagrams B C shows

where the fly should be cast, and B D where it should not be cast ; in fig. 5 the line assumes the shape of a corkscrew, and in fig. 6 it is thrown all of a heap in the water, and it will be seen that the fly cannot be got to work properly until it has reached mid-stream, B E, thus losing the chance of catching the rising fish in half the pool.

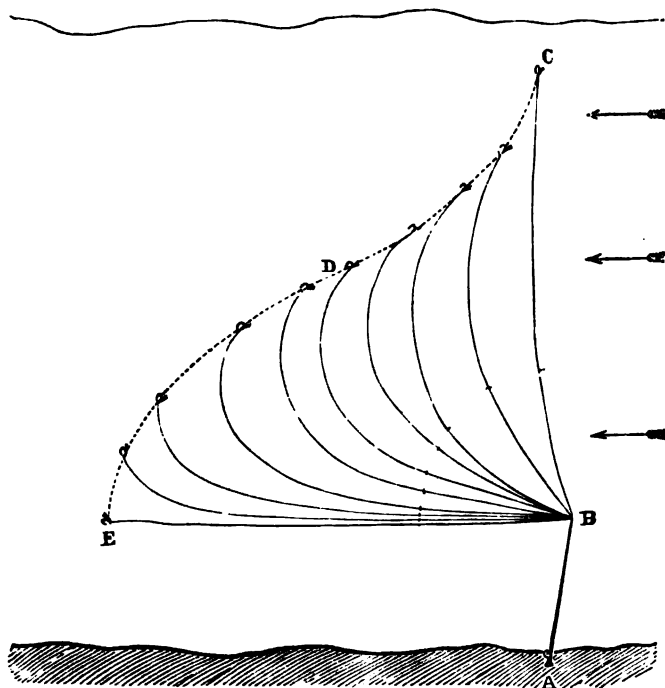


FIG. 4.

I am aware it will be impossible for anyone to follow my directions to the letter, particularly, as is often the case, if there is a foul wind all that can be done is to adhere to them as nearly as circumstances will permit, and to endeavour always to cast the fly in such a manner that the fish can see it before

he sees the casting line. I believe the principle is a sound one, and will guarantee no one is misled by adopting it. I should have mentioned that the fly should begin to 'fish' directly it touches the water, and to insure this a foot may be taken in with the hand through the rings when the forward cast

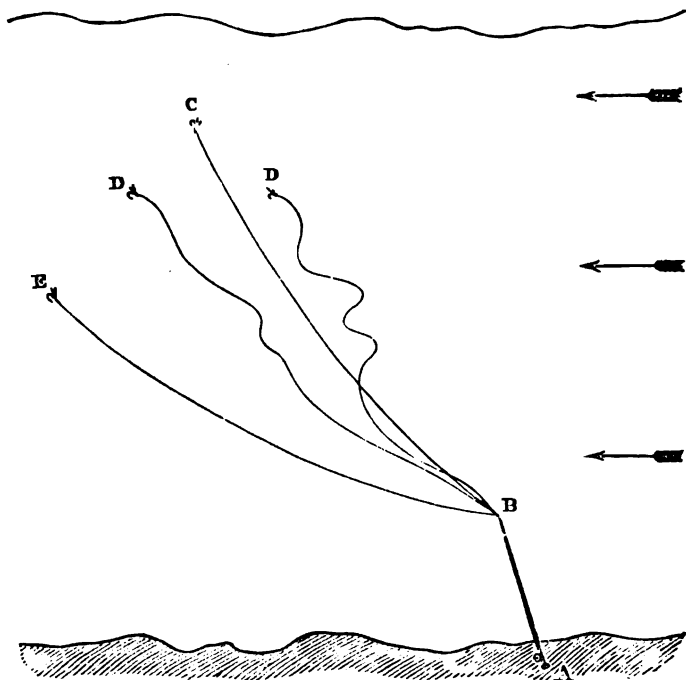


FIG. 5.

is made, which will have the effect of straightening the line in case it has become slack, when the fly will begin to work at once.

When a beginner has perfected himself in overhand casting he may then begin his lessons in casting underhand, which it is quite necessary he should learn, as he will find himself occa-

sionally having to fish streams where if he cannot make an underhand cast he may as well go home.

Of all the various undercasts, the one as practised on the Spey is the most pleasant and satisfactory to make, and, as far as I can judge, a longer line can be got out with it than with

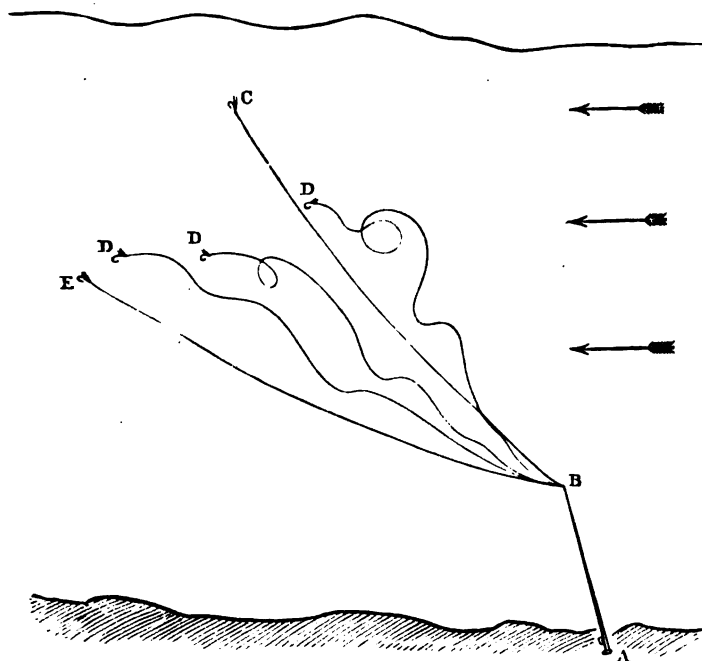


FIG. 6.

any other. It is generally believed this cast can only be accomplished when wading, but if anyone knows how to do it, it can be done with quite as great ease and to as great perfection, when standing on the bank ; but in the latter case it requires a sharp stream to be running evenly close into the bank which is being fished from. Until very recently I found

I could not accomplish this cast from a bank, as in making a cast in the ordinary position the line would invariably come in contact with the bank, and the result was very often the loss of my fly and casting line (see fig. 7). I, however, found out afterwards, that if instead of standing in the ordinary position

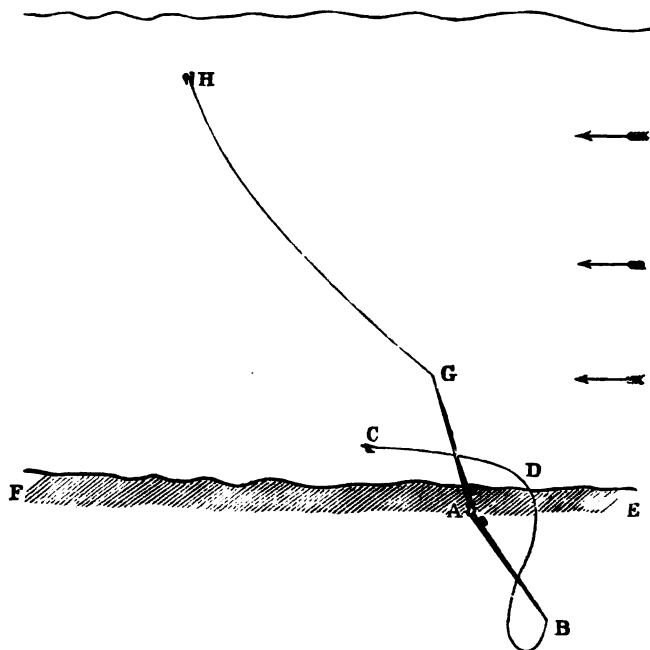


FIG. 7.

F E, river bank ; A, where angler stands holding rod, fishing right-handed, in ordinary position for casting facing stream ; A B D C, position of rod, line, and fly before making forward cast ; D, where fly or line comes in contact with bank ; A G H, position of rod, line, and fly when cast is made.

facing the stream, I made say, in military parlance, a right or left about three-quarter face, down stream when making my cast, almost with my back to the stream (see fig. 8), I could keep the fly clear of the bank, and get out as long a line as I

could when wading. One of the longest underhand casts I ever made was when fishing from a bank in that position, and I have found it so useful that I recommend those who may not know it to give it a trial.

To make a Spey cast successfully, the line should be allowed to be carried well down the stream, straight and tight to its fullest extent, the point of the rod following the direction of the

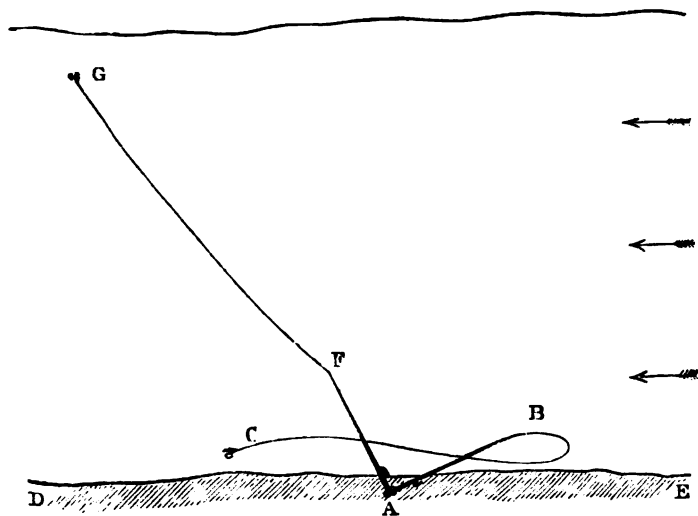


FIG. 8.

DE, river bank; A, where angler stands holding rod, faced left about three-quarters from ordinary casting position; ABC, position of rod, line, and fly before making forward cast, keeping line clear of the bank; AFG, position of rod and line after the cast is made.

fly and held very low. Before making the cast the whole line should be lifted clear of the water. If it is allowed to drag under the surface of the water the cast cannot be made. A rod with a powerful top must be used, and one which has great lifting power. The Spey fishermen, who I think are the finest underhand casters in the world, use rods made especially for the

purpose. The upper portion, instead of being straight, is made in a curve, and, when fishing, the curve faces the stream, which gives a rod made in this fashion a greater lifting power than an ordinary one, but I have always found I could make as good a cast with the latter.

I have made these few remarks upon the 'Spey cast' as it is my favourite, although I find other methods useful at times. To learn how to cast underhand can only be acquired by practice, and in the course of an angler's experience he will have every opportunity of becoming proficient in this branch of the art.

HOW TO WORK A FLY.

There are differences of opinion as to how a fly should be worked. Some fishermen shake their rod so as to make it saw the water, as it were, but this method adds greatly to the fatigue of fishing, and is, moreover, in my opinion, labour in vain. I watched upon one occasion a man working his rod in this fashion. He had out a pretty long line, and when his fly came round close to the bank where I was standing I could see what the effect was. I was rather surprised to see there was no motion given to the fly more than that which was caused by the action of the stream. The fact was the action of the point of the rod did not affect the line at the distance at which the fly was working. I have no doubt that when fishing with a short length of line, shaking the point of the rod would give the desired motion to the fly, although I maintain that in a stream it is quite unnecessary to work a fly at all, the action of the water being quite sufficient to give it a lifelike appearance.

I learnt a lesson when fishing with a cross line where flies are sometimes almost stationary, and I feel certain anyone who has seen the glorious rises which salmon make at flies on a cross line would never think it necessary to work or shake his fly.

The method of working the fly in this fashion is generally adopted by all professionals and many amateurs on the Irish

rivers, and a stranger who does not conform to their ideas in this, as well as in the choice of flies, is put down as a 'duffer.' The first time I wetted my line in the Shannon I worked the fly in my own way, hardly moving the point of the rod. The man in the stern of the boat watched me for a few minutes with disgust written on his face ; at last he sprang up, and before I knew what he was about, snatched the rod out of my hand, saying, 'This is the way we fish in the Shannon, your honour,' and then began to show me the see-saw method. I was rather taken aback, as I fancied I knew how to do it before the man was born. However, I had my own way, had very good sport, and heard no more about it from my friend in the stern of the boat.

The most deadly method of fishing is to hold the point of the rod well down, letting the fly sink as deep as possible. If the fly is worked at all it should be in dead sluggish water, and then only by a very slow 'up-and-down' motion of the top of the rod.

But there is no accounting for the way a salmon will sometimes take a fly.

A short time ago, when fishing the Usk, a friend of mine put down his rod on the bank to go and talk to his wife. The fly was left in the water, and when he returned he found to his surprise a fish was on, and after an exciting struggle he landed him ; he had been fishing that pool for hours before this happened.

HOW TO FISH A POOL.

The proper way to fish a pool is to commence at the head, moving down stream about one yard, or step, before each fresh cast, always taking care the old cast is completed before the downward step is made. This is of greater importance than might perhaps appear, for if the new cast is made first and the downward step taken afterwards, it will make all the difference in the working of the fly. The latter will have to travel all of

a heap for yards before it begins to fish, the disadvantages of which I have already stated. I have seen many salmon fishermen having taken a downward step and made their cast, take one or two more steps forward, without being apparently aware of it. This is one instance of the bad habits a young fisherman may get into, and which he may never be able to break himself of. These are small things in themselves, but, nevertheless, are apt to mar his sport to a degree he is quite unaware of.

When a fish rises to a fly, it is best to wait about thirty seconds before throwing over him again, and the angler should remain stationary and shorten his line a yard or so, by pulling it through the rings of the rod, and not by winding it up with the reel. He should then commence throwing over the fish again with the shortened line, letting out the slack until the exact length is cast which rose the fish. If he does not rise him again, a smaller fly may be tried of the same pattern, and, if needs be, one of another pattern. If this should prove unsuccessful, the fish may be left alone for a quarter of an hour or twenty minutes, the angler continuing to fish the pool down and returning to try his luck again in about that time. He should first, however, in case he is fishing from a bank, make a mark with his heel on the spot where he stood when the fish rose, or, if wading, take some bearings by which he may recover the place where he was standing. He should then try the fly that rose the fish in the first instance, and if he is not successful after one change, he may leave the fish for good.

If, when fishing a pool, several fish rise, but the majority of them are only pricked and not hooked, it may be taken for granted the fly is too large, and the pool should be fished over again with a smaller one. It may be that the colour of the fly is not suitable to the state of the sky, or that it is too easily seen, and has made the fish somewhat shy. If this should be the opinion of the angler, he can change his fly for one of another colour. This is, however, all guess-work, and nothing but long experience will be able to give any aid under such circumstances.

STRIKING A RISING SALMON.

There are different methods adopted for striking a salmon. A great many experienced anglers advocate striking or hitting a rising fish 'from the winch,' without the line being touched. Others say it is necessary to strike with the line held tight between hand and rod. Others, that if the line be held tight between hand and rod, a fish will hook himself without striking; and this latter is decidedly my way of thinking, and I am convinced that striking is a mistake. The question of striking or not striking is of the greatest importance, and I will therefore endeavour to explain the *pros* and *cons* of each system.

Striking from the winch has many advocates. The advantage claimed for it is that, with a properly constructed reel, a salmon can be hooked before the reel plate revolves, but that it will revolve before the fish turns. This may be so, but I cannot understand how the point of the hook, particularly if it is a big one, can be forced over the barb unless the line is held tight, or the winch a very stiff one, a very unpleasant thing to use, and involving the utmost danger in playing a lightly hooked fish. My belief is, that in the case of any salmon struck from the winch, in whose mouth a hook has been found fixed over the barb, the result is due to the pulling and dragging he gets when being played, and which must, sooner or later, have this effect. If an easy running reel be used, which is in my opinion the proper one, the reel plate will revolve the moment the line is tightened in a fish, and, if the line be not held tight, the barb cannot get fixed, unless the hook is a very small one. These remarks are equally applicable to single and to double hooks.

Long before the question as to the advantage of striking from the winch when using double hooks was discussed in the sporting press, I had given the double-hook plan an extended trial, but I lost so many fish with them, that I gave them up. I did not strike from the winch, and I am told by advocates of

this system that my not doing so was the cause of my want of success. They may be right, but I cannot agree with them, and I am convinced that striking a fish, in any form, is a mistake.

Many fishermen advocate striking with the line held tight ; this is accomplished by a sudden upward jerk of the point of the rod the moment the fish is seen to rise, or that it is felt that he has taken the fly ; this is in my opinion the worst possible method, and a very risky one, although it is the one generally adopted. I think the habit has been acquired in consequence of the majority of salmon fishermen having fished for trout in their younger days, before they were allowed to handle a salmon rod. Fishing for trout and grayling and fishing for salmon are two very different arts ; the former are far quicker than a salmon in their action when rising to a fly, and require great dexterity to hook them, but even they do not require to be what is called 'struck' at in the sense that is meant in striking a salmon ; and a slight turn of the wrist, which may be called a strike if it pleases anyone to do so, is all that is required to fix the barb of a trout fly. If the rod was suddenly jerked up, as when striking a salmon, the chances are, with a heavy trout, the casting line would break, and perhaps the rod into the bargain. I am inclined to the belief that striking from the winch would suit trout fishing better than salmon fishing. The evil arising from striking at a rising fish with the line held tight, is that there is great risk, owing to the sudden jerk of the rod, of either smashing the top or leaving the fly in the fish's mouth, or should the fly be suddenly snatched away from him in the act of rising, the disappointment would most likely scare him to such a degree that he would not rise a second time. I have been told that it is necessary to strike at a salmon in order to prevent him from ejecting the fly ; I have already stated my opinion regarding the power of a salmon of ejecting his food. It is only natural he should do so on finding that it was not natural food, but I have myself seen many salmon come at my fly with open mouth, and in such cases striking at him would be most likely to defeat the object in view, and the chances of

hooking him would be far greater if he were allowed time to close his mouth on the fly. It is highly probable that whether he is struck at or not, he often succeeds in ejecting a fly without being touched, having found out the trick that has been played upon him, and it is for this reason that many salmon which have been risen, cannot be tempted to rise a second time. What is desired when a salmon rises is to fix the barb of the hook, and to effect this the surest and safest way, in my opinion, is by adopting the following method : When a fish rises at the fly the rod must be held steady in the same position as before the fish rose; if he has taken the fly he will hook himself by his own weight on his downward course after the rise, and he will soon let you know it. Nothing more is required to fix the barb of the hook unless the fly used is of a large size, when, to make certain of doing so, it may be advisable to give one or two steady 'pulls,' the force of which must be left to the angler's discretion; if the barb is not then fixed it will be in consequence of the point of the hook coming into contact with a bone, when striking or pulling would be of no avail. If, after a salmon has risen it is found he has not taken the fly, the rod should still be held in the same position, and the fly allowed to work as if nothing had happened. By adopting this plan there will be a far greater chance of his rising a second time than if the fly had been snatched away from him; and I have often seen fish that have risen at my fly and not taken it, follow it and make two or three rises at it before the cast is completed, but I do not often remember to have caught a fish following the fly in this fashion. I think it is a sure sign that the fly is too big, and I should much prefer his going back to his corner after the first rise, and giving me a chance of changing my fly. I have also observed that a fish that follows the fly will seldom be seen again. He finds himself before he is aware of it in shallow water, and the chances are he gets scared; this is the only drawback (if it can be called so) that I can suggest to my plan of hooking a rising salmon, and I will now leave it to my readers to form their own opinion on this very important question.

PLAYING A SALMON.

Of all the delights of an angler's experience, there is nothing to compare with that of 'rising' and hooking a salmon.

The rise of a big salmon to your fly is electrifying in its effect. There is a moment of intense uncertainty and suspense as he disappears after having risen, and you are awaiting the result. . . . He has missed it! Your face is as pale as death, and you sit down unable to stand from sheer excitement. You have to wait a minute or two before you make another cast. All cares and troubles, all thoughts of everything and everybody, even of the wife of your bosom, are cast to the winds during those glorious moments of uncertainty; your whole soul is bound up for the time being with the silvery monster you have roused from his stronghold. Perhaps the idea comes across you that your fly is too big, and with trembling hands you change it for a smaller one. Watch in hand, with an impatient longing to be at him again, you wait till the allotted time has elapsed. 'Time is up,' and you rise to again try your luck. You may be an old hand, and no outward sign will betray the beating of your heart, as you proceed to cast over your fish with the same unerring precision as before, as if apparently nothing had happened, and you were only commencing to fish the pool. Or perhaps the excitement will be too much for you, and trembling from head to foot—scarcely able to hold your rod—you will make your cast, but *how* you will never remember. With eager eyes starting almost out of their sockets, you watch the progress of your fly as it comes nearer and nearer to where you rose your fish. 'He should come now,' is your mental ejaculation, and quick almost as the thought a swirl or perhaps a scarcely perceptible wave in the water will betray the presence of your prey. One more moment of intense uncertainty and suspense; you feel a slight pull, then your line tightens, your fly of your own making, in which you took such pride, has done it; 'you are in him!' A thrill of

exultation and joy runs through your veins as those magic words escape your lips. . . .

The foregoing description, however uneloquent, may give those who have never experienced it a faint idea of what every lover of the sport feels on rising and hooking a salmon.

Anglers I have heard of who even consider that when once they have hooked their fish, the sport is over, and hand the rod to their attendant to play and land the fish ; but I prefer as long an acquaintance with my salmon as he will vouchsafe me, and nothing would ever induce me to give up the rod to anyone to play a fish if I could avoid it ; besides, there is the finish to look forward to. The few moments of uncertainty just before the fish is being gaffed or landed—particularly if he should be a heavy one, perhaps the biggest you have ever hooked—are most exciting ; and the fishermen who forego this part of the performance, lose, I cannot but think, a good deal of the pleasure of the sport. There is also a great risk in handing over the rod to an attendant ; in the act of doing so, the line must necessarily get slack, and, should the point of the hook be only skin deep in the fish, as is often the case, ten to one that the angler and fish will part company. Is there a salmon fisherman of any experience who has not often seen his fly drop out of a fish's mouth, the moment he was gaffed or landed, when the point of his rod was lowered and the line slackened ? It might probably not occur to him to ask himself the reason why the fly had dropped out ; but if it did, the fact would tell its own tale, and he would be made aware that if for one moment he had given the fish a slack line, he would never have been brought to bank.

If a fish is well hooked, no harm can come by the rod changing hands ; the angler has often to scramble up a steep bank when playing his fish, in order to enable him to follow him, should he have taken a run up or down stream, in which case he will have to hand his rod over for the time being to his attendant ; but, as it is impossible to tell whether a fish is firmly hooked or not, the rod should never change hands if it

can be avoided. To keep a tight line from first to last is a golden rule that should be always borne in mind by every salmon fisherman when playing his fish. He should hold the point of his rod well up, and keep it opposite to him if he can. Should the fish take a run, ending with a leap in the air, he must instantly lower the point of his rod, which ought to defeat this effort to rid himself of the fly—the object doubtless intended.

In lowering the point of the rod, a slack line must necessarily be given ; but it is a case of kill or cure : if he is well hooked, he will be brought to bank ; if lightly hooked, the chances are against it. It is the 'glorious uncertainty' that adds to the pleasure and excitement of the sport. If it was a certainty, there would be none.

In playing a salmon, the amount of strain necessary to be put on the line must be left to the judgment of the angler, and should be proportionate to the strength of his tackle. It is not generally known what amount of strain a rod can put on. I may therefore mention that, in trying the experiment with a very powerful rod, all I could do was to pull four pounds on my steelyard, which, at first sight, seems very little ; and, if a salmon remained stationary when being played, and the angler were merely pulling dead against him, with a fairly strong casting line, I do not think he could break it, do what he could, unless he gave it a sudden jerk ; but, the moment the salmon began to move and pull as well as the angler, a double strain would be put on the line, and it would probably break, unless of unusual strength.

The foregoing may be of some use as a guide to the amount of strain to be used in playing a fish. If skilfully handled, he will generally be brought to the gaff in from five minutes to half an hour from the time he is hooked. It is not often he will take longer to kill, unless he is hooked foul, when he may keep on for hours. I myself hooked a salmon on the Kirkcudbrightshire Dee about ten o'clock one morning, below the weir at Tongueland, and he kept me the whole day playing him in

the same pool—a deep hole above a fall, with a sunken rock in mid-stream. He got fast in this rock twice during the day, and I had the good fortune (being able to see what I was about) to free the line ; but when it got dark and I could not see, I sent for a lantern ; meanwhile, my fish got fast again in the rock, and broke me ; he gave my attendant one chance of gaffing him, but he missed it, and he never gave another. The fish was plainly seen by the spectators, and he was judged to be a red male fish of about forty pounds. He was hooked under the chin. I put the utmost strain on the line my rod was capable of during the whole day, but he did not show any signs of giving in, and might have kept me all the night. I could not pull him down stream owing to the fall, or it was possible I might have killed him in ten minutes ; he sulked the whole day, and never ran out a yard of line. I should like to have had him on the bank, but, to tell the truth, I was not sorry to part company with him, as I should have felt in honour bound to hold on as long as I was able, which would not have been very pleasant, as it was a cold night in the month of October, and he was hardly worth the trouble. But to return to my subject. If there is plenty of room, and no danger of being broken owing to sunken rocks, roots of trees, snags, &c. &c., it will be as well to put only a moderate strain on the line, and to let the fish run out as he feels inclined ; but there are occasions when it is necessary to hold on at any cost, and not to give an inch of line if it can be avoided. It is astonishing how easily a fish can be cowed in this manner. On a river in the south of Norway that I was fishing with a friend there was a narrow rapid stream, in which salmon congregated in large numbers, waiting to take the falls just above, where it was a certainty to rise or hook a fish. We fished from a high rock overhanging the stream, and there was only one place where a fish could be landed, which was a backwater, about the size of a large dinner table, on the side we fished from. Directly a fish was hooked, it was a case of pull baker, pull devil, and we tried to haul him into this bit of slack water ; and, if we once

succeeded in getting him there, he seemed to lose heart, and gave in at once. I dare say I shall not be believed ; but the average time we took to kill any fish we landed in this pool was about four minutes. A fish over fifteen pounds would generally beat us, for, do all we could, we could not pull him into the slack water. If once he got into the rapid below, down he went, and, not being able to follow him, he invariably broke us. We had to resort to these tactics in most of the other pools in the river we were fishing, but this was the most difficult of all to land a fish in. These are, of course, exceptions to the orthodox methods of playing a fish ; but they show what can be done with good single gut, which was what we used.

If a heavy fish is hooked, and makes a run down stream, then suddenly takes up again, it will test the qualities of the strongest casting line ; the strain on the belly of the line thus made will in all probability, if the line used is a continuous thick one, be fatal ; and it is under such circumstances that the advantage of using a thin back line will be found out and appreciated, the strain on the thin line being so much less in proportion. If, however, any line stands such a test, there is still great danger : for, should the fish take it into his head to come down stream again, the line cannot be reeled in quickly enough, and the slack will get fast in any stones, rocks, or snags that may be at the bottom of the river. If the angler is playing the fish from the bank, he will have little hope of saving it under such circumstances ; but, should he be fishing out of a boat, the chances are far greater against him, as he cannot follow the fish, and is utterly powerless to help himself ; all he can do is to get in the slack line as fast as he can, and, this being a very slow process, reeling in with the rod in hand, the best thing he can do is to put down the rod in the boat, pull in the slack with both hands, and trust to luck to secure his fish.

When playing a salmon from the bank, should the fish prove more than ordinarily stubborn, and show no signs of giving in, it is a good plan, if it is practicable, to coax him up stream as

far as is possible and then pull him down with a run ; if this can be repeated two or three times, he will generally give in.

There is another way of playing a fish that is stubborn : the rod is laid down on the bank, and the fish is hand-played, and, although it does not seem a very sportsmanlike method of proceeding, it is astonishing how quickly a fish will give in when thus treated. I have seen fish that have been played half an hour, showing no signs of giving in, landed in a couple of minutes by hand-playing them. This is a common practice on the Aberdeenshire Dee, particularly during the spring months, when the spent fish, which run to a large size, get recruited, give the angler a great deal of trouble, and waste a great deal of valuable time in bringing them to bank.

GAFFING AND LANDING A FISH.

There is a great art in bringing a salmon to the gaff. It should never be attempted in very shallow water if it can be avoided. The gaffer should always keep a little below where he expects the fish will be brought towards the bank, and wherever he places himself he should remain stationary, in a stooping position, with the gaff ready for action. Should he move about the fish will probably get sight of him, and if he does the chances are he will make a run out into mid-stream, and will not allow himself to be brought within reach of the gaff until he is quite exhausted, fighting it out to the bitter end. What the angler has to do is to wait until the fish is quiet, and if he can get his nose above the water bring him in with a run to the gaffer, who will seize the opportunity, give one clip, and all is over with him. On no account should he attempt to put the gaff in should the fish commence to struggle, but wait patiently until he is quiet again. A fish will often be brought within reach of the gaff over and over again, and just as the gaffer is about to strike him he commences to struggle. This is a trying time for the man who is playing him, but he must not, as is often the case, lose his temper and abuse the gaffer, for

if the latter is of a nervous temperament he will probably make a bungle of the business, and the fish will reap the benefit. It may be taken for granted that the gaffer is as keen and as anxious as the angler to see the fish on the bank, and does his best to secure him for his own reputation's sake. Should he miss a chance and the fish get away, it is doubtless very annoying, but it is one of the disappointments the salmon fisher will have to put up with.

There are few men who can gaff a fish as it should be done. It requires great nerve and a great deal of practice. The Norwegians are the best gaffers I ever came across, with the exception of the Shannon men, whose dexterity is wonderful. To gaff a fish in deep rapid water is a more difficult thing than it appears to be, yet the Shannon men never miss a chance ; they use a gaff made of well-seasoned hazel wood, that will give and take with the struggles of the fish, which run to an immense size. A stiff handle to a gaff would be liable to break when gaffing one of these monsters in a rapid stream, besides being most unwieldy. An inexperienced gaffer will generally gaff a fish anywhere he can put his gaff in, but an experienced man will bide his time and gaff the fish somewhere below the back fin, which will balance him as nearly as possible, and prevent his flesh being torn in his struggles. In landing a fish with the net similar precautions must be taken ; the man who has charge of the net should remain stationary where he thinks it probable the fish may be landed. The net should be held under water with a stone in it, which will keep the meshes in their place. The angler must run the fish in towards the net in the same manner that he would when the fish was to be gaffed. If the fish is quiet he will generally be able to run him in at once, but should never attempt to do so if he commences to struggle. When the head and shoulders of the fish are well into the net, the netter should raise it sufficiently to get the whole of the body within its meshes ; the hoop of the net should be then lowered, the farther end downward, and the handle at the same time raised—thus forming the net into a purse from which there is no escape. The

fish can then be drawn into the bank, net and handle in the same position. On no account must the net be raised high out of the water ; if it is attempted to land fish in such a fashion the weight of the fish will soon tell on the hoop of the net and make it unfit for use. It must never be attempted to net a fish tail first ; he may be got into the net, but he has an awkward habit of using his tail, and would be out of it again before you were aware. When once, however, his head and shoulders are in over the hoop he cannot escape.

Many fishermen gaff their own fish, and will not on any account delegate this office to anyone else. To accept aid would deprive them of half their pleasure in fishing, and if they are of this opinion I think they are quite right ; no doubt there is much excitement in gaffing one's own fish, but it requires great skill and practice to be able to do it artistically. There is, however, a certain amount of risk incurred, as when the line is wound up so short as it necessarily must be to enable the angler to reach his fish, if care is not taken to lower the point of the rod and slack the line the moment the gaff is in, the chances are the top will get smashed. This has happened to myself on several occasions, and the object being to get the fish safe on the bank, I prefer adopting the surer method of having my fish gaffed by my attendant.

If it can be ascertained for a certainty that a fish is firmly hooked, and there is a beach anywhere handy, he can be stranded without the use of gaff or net, but this must not be attempted until the fish is quite 'done' and has not a kick in him. The angler must wait until he can get his head above water, and he can then run him in high and dry without a struggle. If he cannot completely 'strand him' thus, he can put down his rod and tail him ; this is done by grasping him firmly just above his tail with the second finger and thumb. By this means he can be pulled out of the water without risk of escape, and carried to a place of safety ; but it is only salmon that can be landed in this way ; the tails of all other fish, sea trout included, would slip through the fingers, and this is an

infallible test should it be doubtful if the fish caught is a salmon or a sea trout.

Salmon fishing out of a boat in a lake should be carried on on the same principle as when fishing on the river bank, with the exception that a drop fly may be used in addition to the tail fly. A drop fly is often used on a river, but I think it is objectionable in consequence of the risk of its getting foul at the bottom.

MISCELLANEOUS.

There is no accounting for the humour of a salmon. You do not know the minute he will take it into his head to rise ; he will rise freely sometimes on the worst possible looking day for fishing, when no sport is expected. The appearance of a day is most deceptive. You may go out full of hope and certain in your own mind you are going to have great sport, and you will often go home blank without a rise ; but although as a rule it is impossible to foretell in the morning what sort of fishing day it will turn out, there is an exception. If the wind is in the east with a blue hazy atmosphere it seems to affect the fish in some unaccountable way, and while it lasts a rise can rarely be got out of them. I have noticed this hundreds of times, often when the water was in splendid fishing order, and the river full of new run fish, but whatever quarter the wind blows from there is always a chance while the fly is in the water, and to insure success the angler must make up his mind to have many blank days. He must never tire of throwing his fly, and never be put out by failure.

The time of day when I have found salmon take best is between the hours of nine o'clock A.M. and one o'clock P.M., and from four to dusk in the evening. In early spring if there is no frost it will make little difference what hour one fishes, but in a hard frost it is not often a salmon will rise until the afternoon, and then only for a short time. In the latter part of the spring months, when the weather gets bright and hot, the earlier the

angler is out the better, but if the sky is overcast I should prefer the hours I before mentioned for choice. I have frequently known early risers to have flogged all the pools over all the morning blank, and the man who appeared on the scene at nine or ten o'clock to get sport in those same pools. Salmon will often only rise at certain times of the day, and it is luck to come across them when in the humour. There is one time of the evening, however, when I should never despair of catching a fish if I had been blank all day. The time is about a quarter of an hour after sunset, after a hot bright day in the spring months, when the glare is off the water. There was a pool on the Kil-murry water, on the Blackwater, county Cork, that hardly ever failed me under such circumstances ; it was a sharp running water, as smooth as glass, and a very good rising pool at any hour of the day. When there was a wind, I used to commence fishing at sunset, but although I had fished the pool once, twice, or three times, I never could rise a fish until about a quarter of an hour afterwards. It was then a certainty, but the fish were only on the rise for about twenty minutes, and there was seldom time to catch more than one fish. This was the only pool they seemed to care about rising in at this hour, and the less wind there was the more certain I was to get a fish.

When fishing private water the angler can choose his own time for beginning operations, and will have the satisfaction of knowing that his fly will be the first one seen by the fish in the morning, but when fishing in club or open water those that go out late will be considerably handicapped, and will very often have to travel a long way to secure a pool.

A club or open water is a very good school for a beginner to commence his salmon-fishing education. Here he will find plenty of competitors, and he will have a far better chance of acquiring knowledge than if he were fishing in private water, with no one but perhaps an inexperienced prejudiced person as an attendant to advise him. In an open water he will come across old and experienced anglers who, although they cannot be expected to give him information that would mar their own

sport, will be found as a rule ready to offer him good advice if he will take it ; and he may soon learn the rudiments of the art. He will have many opportunities of losing his temper, and will find out that the best thing he can do is to keep it. Fishing in club or open water is a series of 'sells' from morning to night ; all sorts of dodges are resorted to to attain the desired end, 'Sport for self.' I am reminded of the first sentence in the daily prayer of a certain Scotchman, which ran as follows : 'Gude Lord, tak' *every* thing awa' frae *every* mon, and gie it a' to me ;' and this is what many salmon fishermen feel in their hearts as far as sport is concerned. I am happy to say, however, that such 'fish grabbers' are exceptions. A salmon fisherman, as a rule, is always good company and a jovial fellow ; he is always ready to give a helping hand to a brother fisherman, and however much his temper may have been tried during the day it is generally all over at dinner-time, and by the time he goes to bed after a convivial glass or two with his friendly rivals, he has quite forgotten his ill-luck, determined to be up and doing next day. About two years ago I was very cleverly done out of a good pool when fishing in a club water. In consequence of the early risers being in the habit of fishing all the pools over every morning before the hour when reasonable men came out, a rule was made that no fishing should commence before eight o'clock ; consequently the early risers were always on the water long before this time waiting at their favourite pools, watch in hand, ready to commence operations the moment the clock struck.

Not being an early riser, I drove down one morning on the left bank of the river to where there were three celebrated pools almost running into each other, and one of which I hoped to secure. The road I travelled came all of a sudden in sight of the two upper pools, lying nearly parallel to them at a short distance off ; these were fished from the left bank, but the lowest of the three pools was fished from the right bank, and the river had to be crossed at the tail of the middle pool, in a boat, to be able to get at it.

I saw that the upper pool was occupied, and, as I thought, the middle pool also, as I saw a fisherman sitting down on the bank reading a newspaper and apparently resting himself after his labours. I passed down to opposite the lowest pool (which was also close to the road, but hidden from the two upper pools by an orchard) to see if it was occupied, and I saw what I took to be an angler with his fly stuck in a tree on the opposite bank, and the river watchers trying to free the line. I of course took it for granted that the pool was occupied, and passed on to look for a vacant pool lower down, and it was not until afterwards that I found out the trick that had been played upon me. The fact was that the man who was reading the paper on the bank at the middle pool, had been fishing it since eight o'clock blank, and as the lowest pool was a very good one, he thought it just possible he could go and fish it and return to the middle pool (which was by far the best in that part of the water) before any other fisherman appeared on the scene. So he went over in the boat, and while in the act of fishing the pool his fly got fast in the tree. 'Oh, horror! what shall I do? the Major will take my pet pool before I can get back, and I shall be left out in the cold.' However, a plan of action soon suggested itself, and he left his attendant with the rod, crossed back in the boat and adopted the *ruse* I have mentioned, of reading the newspaper in full sight of anyone who was driving on the road, making it appear he was *bonâ fide* in possession of the pool. The thing was so cleverly done that I could not be angry, although the laugh was against me.

There is as much luck in salmon fishing as in any other pursuit we are engaged in, and the most experienced angler will often be beaten by the veriest tyro. It is very trying to the temper of a man who 'fancies himself,' and who is going to teach all the world how to fish, to go home blank. The man who is lucky has no feeling of pity for his neighbour who has been unsuccessful, and, if the truth is known, often chuckles at his discomfiture, even though he should be his bosom friend. Not long ago I was fishing some private water I had rented

with a friend. We used to meet at lunch to compare notes. One day when we met as usual, my friend produced five splendid new run fish, one of them over 20 lbs., and I had nothing to show. I could see that he had no pity for me, and that he was highly pleased with himself, and although I pretended that I rejoiced with him, I was in reality not at all happy and felt very small. This was bad enough, but when, on our separating to resume our sport after lunch, he said to me, 'Well, as you are not getting any sport perhaps you would like to read the newspaper (handing me one), instead of fishing this afternoon,' it was almost more than I could stand. However, I declined with thanks and said nothing more, but I hated him for half an hour most cordially, and vowed I would pay him out some day, and shortly afterwards I had an opportunity of doing so, for I produced eight spring fish one day at lunch time, my friend having only landed a kelt; but knowing what his feelings must be, I did not chaff him or offer him a newspaper to read. May my forbearance be chronicled by the recording angel! That day I killed eleven fish, averaging 10 lbs., the best day I ever had spring fishing.

I have seen many strange incidents during my salmon-fishing experience, but the cleverest thing I ever saw done was by the above-mentioned friend. He was fishing a pool in the Blackwater, co. Cork, a short distance above me. All of a sudden I heard shouting, and when I went to see what was the matter, I found that after a long play he had been broken by a big salmon, who took away his fly and about forty yards of his reel line. He had put on another casting line and fly and was fishing the same pool down again when he noticed a fish rising two or three times in a very eccentric manner, and the idea struck him that it was the same fish that had broken him trying to get rid of the fly and line. He was a man of great resource and never at a loss what to do in any case of emergency, so he took off his fly, put on a triangle weighted with a good bit of lead, and casting this over the stream below where he saw the fish rise, and dragging it across, in a little time he succeeded in recover-

ing his line, and the fish being quiet at the moment he was able to pass the end through the rings of his rod, and attach it to what was left on the reel. In a few minutes I had the pleasure of gaffing the fish ; he was new run, and weighed 20 lbs. The pool he was fishing was a quarter of a mile long, and very broad, and it was a hundred to one against his recovering the line. On looking round after I had gaffed the fish I missed my attendant, left in charge of my rod, who did not appear on the scene until some time after the fun was over. The fact was he had taken advantage of my back being turned to go into the hut, which was close by, to eat my friend's attendant's share of a very good lunch we had brought with us for an expected visitor. He managed, however, to pick up a very good version of the story, for shortly after we heard all over the garrison of Fermoy how he had been the instigator and prime mover of the whole thing from beginning to end, including the gaffing of the fish.

There are stories of monsters that inhabit the deep holes in the Blackwater, and the following may be amusing :

About twelve years ago a man of the name of Maurice Hallahan was trailing a bait out of a boat at a place called Hallahan's Rock, between Clondulane Weir and Fermoy, where the depth of the hole is supposed to be at least forty feet. He hooked a big fish, and having no one to help him put down the oars and held on to the rod, the fish dragging the boat and man after him down as far as Ballydoroon stream, up again past the Rock as far as Mount Rivers, and back again to the Rock, where after sulking for hours he took up the Funcheon River hard by, when, getting into shallow water, Hallahan put the gaff in him, but the fish was so heavy he could not get him into the boat, and was obliged to let go. The fish in his struggles broke the line, and made a bolt down the Funcheon again to Hallahan's Rock, and was seen no more that year. The year after a gallant Major quartered at Fermoy was fishing the same hole and hooked a big fish, which was gaffed after a long play—Hallahan's gaff still in him, with enough wattling

growing upon it to make a basket to carry him home. The weight of the fish has never been ascertained, and it is justly supposed never will be. I think it right to state that the Major was not the author of the story.

I have made no specific reference in this article to fly fishing for any of the *Salmonidæ* except the true salmon, *Salmo salar*.

Of the two other migratory species, the bull trout, *Salmo eriox*, and the sea or salmon trout, *Salmo trutta*, the former possesses very limited interest for the fly fisher, and in regard to the comparatively few rivers in which it will rise to the artificial fly the general observations which are here offered on salmon fly fishing will be found applicable.

Sea-trout fishing, on the contrary, takes, as a sport, rank next to salmon fishing itself. In many parts of England and Wales, and over most of the districts of Scotland and Ireland, the sea trout, under this or some local name, is known and fished for. As in its relative size—standing in this respect between brown trout and salmon—so in the tackle, flies and rods employed in its capture, the bright gamesome *Salmo trutta* occupies a sort of half-way house between the two species. The most convenient-sized rod, whether for lake or river fishing, will be found to be what is known as a double-handed trout rod, from 13 feet to 16 feet in length, and carrying a reel and line similar to that used for salmon-fishing, but smaller and lighter to suit the shorter and less powerful weapon. As to the mode of using the rod, casting, &c., the instructions given in regard to salmon fishing hold good almost in their entirety, as also those on gaffing, netting, and so forth.

With respect to the flies used, which again stand midway between salmon flies and brown trout flies—ranging from the ordinary sized lake trout fly up to a large grilse or small salmon fly—there can hardly be said to be any generally known or accepted standard patterns. Almost every locality (I might say almost every fisherman) has its own patterns and ideas. The only point in which there can be said to be the smallest approach

to unanimity is in regard to a certain amount of silver or gold tinsel being a desideratum in the construction, or rather decoration, of the bodies, which otherwise may be dressed smooth, with floss silk, or rough, with mohair ; and of all shades and colours of the rainbow—yellows, reds, and blues being, perhaps, the most generally favoured.

All legal restrictions in regard to the times and methods of salmon fishing apply equally to sea trout, the habits of which are also generally very similar ; it is unnecessary, therefore, to lay down any separate rules on the subject.

And so I say farewell, and wish all my brother sportsmen our old greeting on the Conway—‘ A tight line ! ’

JOHN P. TRAHERNE.

IF Salmon fishing be, as claimed by its devotees, the 'noblest' branch of fly fishing, there can be no doubt whatever that Trout fishing is the most popular branch; and, indeed, good Trout fishing appears likely soon to become as difficult to get as Salmon fishing was twenty years ago. Comparatively, though not positively, it is still, however, easy to obtain—just in proportion, in fact, as there are a hundred streams and lakes containing the former fish for one that produces the latter.

As the taste for Trout fly fishing has increased—which is only another way of saying that the Trout is more fished for—so does the difficulty of catching him become more conspicuous, and success must be sought not alone in a high degree of skill in the actual use of the fly rod and line, but also in refining to the very utmost every item of tackle employed. To keep well out of sight of the fish it is proposed to catch is another golden rule, rarely to be neglected with impunity in these days of enlightenment and progress. Clearly in this case

. . . Distance lends enchantment to the view,

so far as at least one of the parties to the transaction is concerned. 'Fine and far off' is, therefore, a maxim invaluable in both Trout and Grayling fishing, and appropriately introduces the reader to Mr. H. R. Francis' article, whilst indicating at the same time its scope and line of practice.

H. C.-P.

FLY FISHING FOR TROUT AND GRAYLING:

OR

'FINE AND FAR OFF'

INTRODUCTORY.

IT is a shallow as well as a dismal scheme of life which ignores or undervalues the importance of recreation. Never, I believe, was there an age in which it was more indispensable 'For weary body and for heavy soul.' We are living at high-pressure; business has become more engrossing and the pursuit of what is called pleasure more laborious. It is more than ever desirable to find occasional change of scene and occupation which shall be really refreshing; which shall at once recruit our bodily energies and give free play to faculties and feelings which are shelved during the daily routine of working life. Mere locomotion is not enough; our thoughts must be turned into new and pleasant channels, and we must seek places suited to new phases of agreeable activity. It is told of one of the most eminent of English conveyancers that when induced for his health's sake to visit the seaside, he carried with him, by way of light reading, 'Fearne on Contingent Remainders.' Sea air may have done something for him; but where was his recreation? His mind was kept running in the old groove.

It is of course true that what is recreation to one man might be mere weariness to another of different tastes and habits, who feels the strain of over-work in different functions

of body or mind. A well-earned holiday may be employed in fifty different ways, each having its own fitness. But in comparing various recreations we may fairly give the palm to that which suits the greatest number of cases ; that in which the largest proportion of intelligent men can find healthful bodily exercise combined with light yet interesting occupation for the mind. And I know none which satisfies these conditions more completely than angling. In its most refined form indeed—I need hardly add that I speak of fly fishing—it rises to the dignity of an elegant and ingenious art, combining in a singular degree the active and the contemplative, the practical and the scientific element.

I have had my fair share of other more violent, perhaps more exciting field sports, and am not insensible to their attractions. Happily, Piscator in these days need not wage a wordy conflict with Venator or Auceps, for the same men often excel in several branches of sport, and the friend whose opinion on the following pages of angling notes I shall value most highly is not only well known in the hunting field but singularly successful in the practice of falconry.

Instead of apprehending any lack of sympathy with the zeal for my favourite recreation which leads me to add yet another to the many contributions recently made to its literature, I rather fear that I shall be held to have done but scant justice to its varied attractions and resources. . . .

But I will not open my case with an apology. An angler from boyhood—a fly fisher for more than fifty years, I will rather ‘assume desert,’ so far as to claim a favourable hearing for my experiences of an art which I can still practise with healthy enjoyment, and in despite of age, with a fair measure of success.

The very name of fly fishing carries back my fancy to many a pleasant hour—many a lovely scene. Once more afloat on the still bosom of a Highland loch, I watch with eagerness the dark line widening from its western shore, welcome herald of

the breeze that will soon break up the 'mellow reflex' of the landscape around me, and refill the frame of the mirror with rippled silver. The purple-robed, grey-headed hills seem closing in upon me; high overhead sweeps the eagle, watchful, yet seemingly unterrified; and see, by the foot of yon burnie the roe has stolen forth to drink, from his green couch amid the birches and brackens. Or, knee-deep in a ford of the Teme, where he lingers lovingly in many a circling sweep round the ivied cliffs and oak-clad slopes of Downton, I wave a potent, and in that well-proportioned stream, 'all-commanding wand' over the rough eddy, sentinelled with watchful trout, or where the quieter run deepens into the haunts of the grayling. Now I seem to hear the hoarse chiding of the Greta, as he chafes along his narrow bed, or the roar of 'old Conway's foaming flood'—now the gentle murmur of some English stream, rippling through sunny meads, is 'rife and perfect in my listening ear.'

The enjoyment of these local memories is heightened to anglers by association with the stirring details of what is always an interesting, often a most exciting sport. We remember where the monarch of the brook, long coy and recusant, was at length fascinated by the drop of the tiniest of midges over his very snout; and where, with our gillie's assistance, we contrived to land three lusty trout together, like the elfin in the ballad, 'a' dancing in a string.' We execrate the treacherous stake which had well-nigh robbed us of a good fish and a cast of flies at once, or bless the memory of the smooth sand bank, pleasant to weary feet, where we at last headed, turned, and wound in the salmon who had kept the lead for some three hundred yards down a rocky channel, among stones loose, sharp, and slippery—perilous at once to shins and tackle. How have we enjoyed the early breeze that crisped the stream on a summer morning; the well-earned rest on a mossy bank in the deep hush of noon, and the homeward stroll through the pensive calm of evening.

Independently of the fishes and insects with which the angler is more specially concerned—in themselves a little world of

marvel and mystery—his avocation gives him no common opportunities for observing some of the most beautiful and curious forms of animal and vegetable life. Stealing along by the water's edge, his footfall lost in the murmur of the stream, or muffled by Nature's carpeting, he enters unsuspected the haunts of the shyest creatures. He sees the otter glide down from his cairn, or lift his sleek treacherous visage in the midst of the pool ; he notes the general consternation of the salmonidæ at the sinuous rush of the seal, whom hungry pursuit has tempted beyond the salt water ; ' doe and roe and red deer good ' slake their thirst in his sight ; he surprises the blackcock's deserted mate and progeny in their moist dingle, the wild duck and her brood as they paddle through the sedges. Leaning back against the trunk of a willow, he sees the kingfisher, a living sapphire, shoot close to his dazzled eyes, or from her perch over his head drop on a sudden plumb into the river, and as suddenly emerge with her prey ; or hidden in the shadow of an overhanging rock, he marks the water ouzel, glittering in a silver panoply of air bubbles, run briskly along the sandy bottom of the burn. Even the innocent gambols of the much-calumniated water rat, joyous after his guiltless feast of grass and water weeds, or the familiar wiles of the nesting peewit will find him not an un-amused spectator. If a botanist, he will pick his choicest ferns in the damp rocky hollows by the waterfall, his rarest lichens on the bare slopes above some Alpine tarn, his favourite orchises in the meadows watered by a well-peopled stream. He will rejoice in the delicate beauty of the pinguicula along some tiny moorland runnel, and admire the silver-fringed stars of the bog-bean beside deeper and blacker waters, where the quaking turf craves wary walking. Mr. Balfour's utmost indulgence would hardly admit me to a degree in botany, yet it was with a glow of pleasure that I first found myself throat-deep in a bed of the *Osmunda regalis*, on the banks of the Leven, or gathered the ' pale and azure-pencilled ' clusters of the wood-vetch by Greta-side, or discovered the fringed¹ yellow water lily on the

¹ *Villarsia nymphaeoides*.

Thames, gleaming like the floating lamp of a Hindoo votaress. If a geologist, the angler may ply his hammer and fill his note book along the very stream or tarn whence he fills his basket. If an artist, his rambles will acquaint him with every form of the picturesque, from the stern grandeur of Llyn Idwal to the tranquil beauties of Father Thames.

It is this many-sided character of the angler's art which has united so many suffrages in its favour, and has made it attractive to so many distinguished men of such dissimilar tastes and characters. It is this, finally, which has given to the art a literature of its own, abundant and various, in proportion to the number of its votaries and the diversity of their minds, and often highly enjoyable even by the uninitiated.

Writing as long ago as the year 1856 on a subject in which I then felt, as I still feel, the liveliest interest—that of the fly fisher and his library—I found a plea for my essay in the national taste. We were, I remarked, *a* nation of sportsmen, but *the* nation of anglers.

And now, after twenty-seven years, fresh from the attractions of the Fisheries Exhibition, I feel that what then was a truth is now almost a truism, and remount my favourite hobby in the full belief that in spite of the lapse of years he is not yet 'forgot.'

Both the art and the science of angling have made great progress in the interval; the education of our fish has advanced, and it is only an equal progress on the part of the fly fisher which can enable him to maintain his old mastery over the salmonidæ. And if I venture to believe that I can still offer something worth a reader's notice on questions now better understood than ever, it is because I have retained my old taste for fly fishing in all its freshness, have pursued the sport on occasional leisure days both here and at the Antipodes, and have preserved a careful record both of successes and failures.

I take my motto from Charles Cotton, whom even more than dear old Izaak Walton I regard as the father of modern fly fishing. In those bright Derbyshire streams which he loved

so well and doubtless fished so skilfully, to fish 'fine and far off' still gives the angler his best chance of success, and there are few waters fairly worth fishing where it may not be practised with advantage.

But at the outset of remarks which are nothing if not practical, I ought to observe that even in following Cotton's admirable rule there may be mistake or excess. The rule is, in fact, only one method of carrying out the great principle which underlies all success in fly fishing. Unless under exceptional conditions of weather, water or both, Piscator must above all things keep out of sight; must not allow Piscis to catch a glimpse of himself, his rod or the shadow of either; must show him, in fact, nothing but the fly which is to 'lure him to his own undoing.' This principle, it may be said, is too obvious to be worth stating. Yet if generally admitted it is very insufficiently acted upon. Not long since I was chatting with a friend near Wansford Mill, on the well-known 'Driffeld Beck.' He had been trying the lower water whilst I had fished down stream to meet him. The day was bright with little breeze, but the fish were feeding, and my brother angler's creel hung heavy at his back, while the lad who carried mine seemed nowise sorry to rest it on the bank. A third angler appeared on the scene. He was striding along close to the water's edge, down stream, making from time to time a long cast with a two-handed rod across the open beck. He really did not cast badly, though his tackle seemed rather coarse and his fly was of a size strange and alarming to Driffeld trout of the present generation, whatever it might have been to their remote ancestry. But my friend and I were well aware that as he moved, there was '*fuga et ingens solitudo*' in front of him; that the fish were literally scudding in shoals from his obtrusive presence.

This was no doubt an extreme case, but the same error in kind, though less in degree, is constantly committed even by practised hands. I do not find crawling or crouching till within four or five yards of a 'shy' stream quite as easy as I did forty years ago, but I resort freely to each as my cast re-

quires, and often withdraw completely from the bank to move again cautiously towards it without the risk of sending an alarm along the stream. Yet I can never fish a bright water on a bright day without saying to myself a dozen times, 'I might have had that fish, had I only kept better out of sight.'

There are of course many streams, mountain and moorland, where such cautious tactics are needless; but in the best English trouting counties—Hampshire, for instance, or the East Riding, Buckinghamshire, Salop or Devon—concealment is the first requisite for sport. In order to this, there are many details to be studied. In the first place, if the day be sunny, try as far as possible to look the sun in the face. To feel his warmth on your back and shoulders is doubtless far pleasanter than to be dazzled by his light, both direct and reflected from the water; but if you want a heavy basket you will disregard the inconvenience for the sake of remaining unseen. Beginning by a short cast under your own bank, you will gradually lengthen your throw till your stretcher drops in deep shade close under the opposite shore, and each fish successively covered will see your fly before any shadow from rod or line falls over him. If the wind as well as the sun be in your face, humour it as best you can by casting aslant, and working your rod horizontally instead of vertically, but unless it blows great guns, when the light from behind you will do little harm, persevere in defying both sun and wind. 'It's dogged as does it.'

Secondly, avail yourself of every scrap of cover. On no account let a fish see your figure relieved against the sky. A big bush judiciously employed as a screen may enable you to do more with a short line than the best far-off casting could achieve without its shelter. The apparent stupidity of fish swimming high in a still sunny pool when thus approached under cover is often most amusing. I have seen large trout in the middle of a July day swim leisurely up to my fly and suck it in without the slightest misgiving. If bushes are wanting, a slight fringe of waterside plants and flowers—willow herb, loose strife, figwort and the like—often does good service by blurring

the outline of your figure. Even the colour of your clothing is not unimportant. Black or white are on a bright day equally objectionable, especially for your hat. It should be remembered, too, that a screen is useful behind as well as in front of you. When there is barely footing between a high hedge and the water—I have a few such spots in my mind's eye—the fish will hardly be aware of your presence unless you exhibit some violent contrast of colour. But a far commoner illustration of my meaning may be found in the neighbourhood of mills and factories, where a dead wall lies near the margin of an inviting stream or pool. Move cautiously with your back close to the brickwork, and you often find to your surprise and satisfaction that while you see the trout on the feed, they fail to see you. Casting from such a position no doubt requires a peculiar knack, but that difficulty once overcome the game is all in your favour. The fish to whom you have thrown takes the fly in the most confiding manner, and till repeated experience has familiarised you with this result the whole affair seems almost uncanny—as though you had the fern seed and walked invisible. There will, of course, be great danger of betraying your presence when landing your fish, and I can only recommend you to keep as close to the friendly wall as you can till you have led your trout some way down the stream, and not to use the landing net till he has made his last rush.

There is another aid to concealment which I think is not generally recognised, but to which in certain waters (notably in Foston Beck in the East Riding) I have owed many a brace of heavy fish. Every angler has obtained some bold rises by casting somewhat heavily so as to break through the coating of foam—'beggars'¹ balm,' Walton calls it—which forms over eddies for some distance below a fall or strong rush of water. But in calm hot weather there often forms over the shore-ward

¹ I have always suspected a mis-spelling here on Walton's part; there is nothing suggestive of fragrance or healing in such scum. *Beggars' barm* must surely be the true word—yeast which costs nothing.—[No doubt this is so.—Ed.]

surface of still and somewhat shallow water a fine oily film, due partly to the sporules of water weeds, but mainly, I believe, to the floating ova and larvæ of minute insects, which is only visible in particular lights, and yet very effectively dulls the quick sight of the trout. When you see a patch of inshore water dimmed by such a film, keep low within an easy cast and wait till you see not a distinct break or rise but a slight dimpling of the water caused by the suck of a fish. Drop a single fly a little above him, and his capture is almost a certainty. The value of this resource lies in its being most available in apparently hopeless days, when there is a strong sun and no breeze stirring.

Yet again, fish may often be taken, though at some risk to your tackle, when they are lying in small open spaces among weeds. Keep low—for on bright days this is a *sine qua non*—and if your fish be but a few inches below the surface the refraction will prevent his seeing you or your rod, and a long cast up stream or across will take him off his guard. But in such a case there must be no playing him; ere he has recovered the first shock of finding himself hooked he must be hurried down stream along the surface till you have him in open water, and can square accounts with him at your leisure. In this rough-and-ready process the hold, of course, may give way, and possibly the tackle. The latter disaster is, however, less frequent than at first sight would seem probable. The fish is taken by surprise, and has no time for organising an effectual resistance, while his forced march down stream quite upsets his ordinary habits. It is when you are fishing a loch on a breezeless day and are tempted to throw over a fish whose 'neb' you have seen quietly thrust up in a small opening among water lilies that the 'deadly breach' is most 'imminent,' and 'hair-breadth 'scapes' only attainable by the happiest combination of caution and audacity. There is no current to help you, and one turn round a tough stalk will lose you both fish and fly. Yet I can remember on a sultry July afternoon, when there was no other possibility of getting a rise, killing in Loch Kinder by this

perilous cast four or five brace of pretty fish with the loss of but a single fly.

I am tempted here to give some instances from my own experience of success attained under difficulties by *keeping out of sight* in various ways.

There was a reach of the upper Itchin where I had more than once found the trout, though sizeable and fairly numerous, yet provokingly wary and suspicious. The bank on one side was absolutely bare and very low ; on the other—the southern side—it was steep and moderately high, by no means favourable to ‘keeping dark.’ But parallel to the course of the river, and at nearly the same level, there ran an irrigation cut, some two feet deep with rather a muddy bottom, about five yards distant from the main stream. Into this one day I lowered myself—having long legs and wading boots to correspond—and worked the stream with a double-handed rod by long casts. I could only just see the opposite edge of the water, but was consoled for losing my view of the fish by knowing that the deprivation was reciprocal. The dodge completely succeeded. Though I felt the rises instead of seeing them I rarely failed to hook my fish and very seldom lost him when hooked. The difficulty lay in scrambling out of my ditch and rushing towards the river before my prisoner could bring me to grief by dashing under the near bank. In this way I did considerable execution on several occasions. I ought in frankness to admit that with more fishable water within easy reach many anglers would have thought the success hardly worth the pains it cost. This was certainly the opinion of a dear old friend and fellow-sportsman who witnessed my first *sortie* from the trench and landed my fish for me. He laughed till he cried at the figure I cut in scurrying towards the bank, and could never afterwards be induced to exhibit himself in the like undignified position.

I take my second instance from a lucky hit in loch fishing. Some thirty years ago I was afloat with two friends on Loch Treig, to the farther end of which we intended to fish our way.

It was a hot forenoon in August, one of those tantalising days when,

Instead of one unchanging breeze
There blow a thousand little airs,

and I soon perceived that there was little profit in hunting the 'catspaws' which supplied the needful ripple—if you could only catch them. So I induced my friends to land me some three miles from the shepherd's hut at the end of the loch where we were to find our luncheon. I was equipped for wading, and had before me several reaches of fine gravel where the water deepened very gradually towards the 'broo'—that critical point, where, in this as in many other lakes, the shoreward shallow rapidly shelves away into water too deep for the fly. In fact it often happens that at this point a belt of water from ten to twenty yards in breadth contains all the best of the taking fish. Within this belt are mostly small fry, without it lies the deep, only fit for trolling. The water before me was smooth as glass, the bottom delightful for wading. Moving cautiously to make the warning wave which must precede me as small as possible, I advanced into the lake as far as I could, and as I did so became more and more aware that fish were moving just where the water deepened within a long cast of my two-handed rod. I threw but one fly, and that smaller than the size I usually preferred. Throwing as far as I could, I let my whole cast sink before giving any movement to the fly, and was repeatedly rewarded by finding that a trout had hooked himself a foot or so under water. Every now and then, however, the fly dropped so close before the nose of a feeding fish that he was fast on the instant. Briefly, when we met at our tryst (where I confess to have been half an hour late) my friends had three fish between them, whilst I had six-and-thirty. In this case it will be seen the secret of success lay in keeping low, so that the effect of refraction kept the unimmersed portion of the fly fisher's figure practically out of sight.

My next illustration shall be one out of a thousand memories of the famous Driffeld beck. It was a July day some forty

years ago when I drove over from Hull to enjoy a day's fishing and dine with the club in the evening, which in those days meant half-past six. I did the twenty-three miles in two hours and a half, and before eight o'clock had stabled my horse at the 'Bell'—a cheerful, cosy inn, which I am happy to add still flourishes, for the comfort of anglers, in the old country style. Early as I was, however, the sun was yet earlier, and by the time I had disposed of a substantial breakfast the day was already sultry without the faintest promise of a cloud or breeze. Having exchanged greetings and predictions of empty creels with two or three members of the club who had slept at the inn and were just making their first appearance, I strolled into Dobson's for two or three special flies, and then started for the King's Mill beck—the uppermost and liveliest reach of water near the town. Here, however, I found myself forestalled, and fishing in the wake of an angler who 'scatter'd tumult and affray' along the stream by a lavish exhibition of his person. Nothing went right, and at noon I found myself at Sunderland Wick bridge, with a brace only of fish in my creel, surrounded by still waters and with a blazing sun overhead. No look-out could well be worse. But as I gazed up the beck I caught a gleam of hope. Some thirty yards above the bridge a still back-water joined the main stream, and over the junction drooped a large willow. I missed the tree last year and lamented it as Cowper did his felled poplars. But it was then full of life and leaf, and just outside the sweep of its boughs a legion of gnats were playing. Yes! there was a rise—and there another—and anon three or four snouts came to the surface at once. In another minute I was lying on my face by the sedgy bank within a long shot of the enemy, my rod held low, while my single fly, a small black gnat, wavered in the stream far below me. I lay low, like Brer Fox, till I felt sure that the trout had not taken the alarm, and then on the first ruffling of the water by several consecutive rises dropped my fly with a long horizontal cast just behind the willow. That moment I was fast in a good fish, which I worked steadily

down stream, never rising from my knees, till I brought him within reach of my boy, who was ambushed with the landing net close above the bridge. No. 1 safely basketed, I resumed my former position, and waited ten minutes before essaying another cast, which proved immediately fatal to No. 2. In brief, I continued these tactics till I had landed six brace of good fish from that one spot, and then sauntered leisurely towards my inn, intending to have my fish weighed at Dobson's by the way.

I have already mentioned this name in the baldest fashion, and ought to explain that the worthy watchmaker who bore it was in those days a sort of factotum to the 'D.A.C.' An angler himself, he well knew what part of the stream would promise the best sport on a given day, and what fly was likely to be strong on the water. Then he was purveyor-general of tackle, his assistants tying not merely attractive but strongly built flies, which might be trusted with the heaviest fish. Lastly, he kept the register of captures, now left to the head keeper, and it was the common practice after a day's fishing to take one's basket to his shop to be weighed. My boy Keddey hurried on thither before me, proud of his burthen, but on overtaking him at the door I found him sobbing bitterly. He expounded his grief in these broad words: The gentlemen *will* say yo' nobbled 'em, and ah know yo' didn't.' The fact was that there were six rods on the water that day, and my fish weighed 18 lbs. as against 14 lbs. to the joint credit of the rest. A novice, the 'net proceeds' of whose day had been *nil*, started between joke and earnest the notion that I must assuredly have been plying my landing net in the spring-ditches. Hence my poor boy's sorrows. How well I remember the jovial club dinner of that evening! I had much *los* when the tale of my success was told. But in truth there was little to brag of; anyone might have done the same who understood fishing 'fine and far off,' and spared no pains to keep out of sight.

The question of fishing up or down stream is closely connected with this part of my subject. There is now so general a

consent amongst anglers in favour of up-stream casting that it would seem superfluous to give the reasons which make it preferable in most cases. I am rather inclined to remind brother anglers that the rule must not be made absolute, and to point out some cases in which the opposite course should be adopted. And first, if in fishing up stream you would have a strong sun at your back, you will betray your presence less by making your beat downwards. This, however, must not involve the absurd blunder of hauling your flies against the current, thus making an unnatural ripple which cannot but alarm a trout of any experience. In fishing down stream, begin if possible from a stand several yards distant from the margin, and throw lightly over the in-shore water a little above you, lengthening your cast by degrees till you have covered three-fourths of the width. Then, and not till then, you may advance warily to the bank and try the deadly cast under the opposite shore. From first to last you must take care that the movement of your flies be natural; that they go down easily with the stream, with occasional slight checks from the wrist to mimic the struggles of a drowning insect and produce that play of legs and wings which is so irresistible to a hungry trout. Retire from the bank after working out your cast, and repeat the same process a dozen yards farther down. If you hook a good fish, let him fight up stream as long as he will, that you may avoid disturbing unfished water in bringing him to the net; but should he insist on a downward rush do your best to keep ahead of him, showing yourself no more than is absolutely necessary. The portion of the stream which you are thus compelled to hurry by should be allowed a good spell of rest before you move up again to fish it.

And here I must be allowed a brief digression. Fish get an inkling of your movements in two ways—by sight, and by a sense of vibration which is equivalent to hearing, and you must be on your guard against betraying yourself either way. If the river you are fishing runs through a rocky bed, you need not walk warily except for the safety of your ankles. But if it runs through boggy soil, or between banks of loose and crumbling

pasture land, you must tread softly and cautiously. A heavy or hasty footfall will be felt by the fish under the near bank, who will rush out and spread alarm among their friends in mid-stream.

I remember finding myself in a ridiculous fix in some pasture land of the 'crumbling' character along the Leintwardine club water. The favourite dog of a friend, who was busy with his hammer among the neighbouring strata of old red sandstone, deserted his master's company for mine, having found, as I verily believe, trout more amusing than trilobites. Unluckily there were sundry cattle about—hideous white-faced Herefords—who kept charging after poor Crab, and driving him to my feet for refuge. They always stopped within a few yards of me, but their trampling had a visible effect on the trout whom I wished to circumvent. There was a general hurry-scurry over the shallows. I might as well have been casting from the deck of that *bête noire* of Thames anglers, a steam launch. I felt, like the legendary Cambridge Don when *Frau Professorinn* presented him with twins, that 'I must put a stop to this.' So I hardened my heart, filled my pocket with pebbles, and pelted poor Crab till he found he must shift his quarters, and scuttled away to his master with a train of bullocks stampeding in his rear. This of course was an extreme instance of bank shaking, but many a time and oft have I known a heavy and heedless footfall mar the success of a promising cast from similar ground. And I could point out several reaches of well-stocked water which most of the local anglers have come to regard as scarcely worth fishing simply from their not allowing for the 'quaking' character of the ground. Experience alone will teach the necessary caution, but where the buck-bean shows its silver stars, or 'the wild marsh marigold shines like fire,' the fly fisher may at once accept a notice to move gently and lightly.

To return to the question of 'up' or 'down.' In a very rapid river, again, more, I think, is lost than gained by the up-stream cast. The line is brought down so rapidly to the caster that it is hardly possible for him to keep it taut enough for the fish to hook itself, and 'striking' is practically out of the question.

Moreover, as the fly gives more hold to the water than the gut, and therefore moves faster, it is apt to be rolled back on the footlinks, and presented to the eye of the trout with most suspicious surroundings. Yet again, there are some places, and those often favourite haunts for fish, which must be fished down stream or not at all. Let me give one example out of many. There was a small bye-wash, some 120 yards long, leading down from the upper to the lower branch of a Hampshire stream; the near bank sedgy, the farther bank completely overhung with dwarf willows. It was scarce five feet wide, but mostly deep, and presenting in miniature every variety of stream and pool. But to throw on it was simply impossible, and I shall never forget the face of the old keeper when he saw me proceeding to fish it. He sat down and lit his pipe, expecting a quiet time till I returned to my right mind and the open river.

Beginning at the top of the streamlet, and keeping the point of my rod under the overarching boughs, I let my tail fly float down the water, varying its descending movement by wrist-play, while my dropper made dimples on the dark surface. In half a minute I was shouting for old W—— and the net. Luckily the fish chose to run up stream; a powerful rod and shortened line enabled me to keep him out of the willow roots, and he was easily netted in the hatch hole. A second capture followed very speedily, but the fish took down the watercourse, and I disturbed fifty yards of promising water in my struggles to keep him out of mischief. However, I managed to basket a third fish before I reached the junction with the main river. I tried the same unscientific but killing process on a dozen subsequent occasions, never taking more than three or less than two trout in that tangled thread of water. All these fish were dark-skinned, owing to their shady *habitat*, and all pretty nearly of a size, weighing from eleven to fourteen ounces, something doubtless in the conditions of the water making it a suitable feeding ground for middle-aged trout, though the cause of 'this thus-ness' I cannot pretend to explain.

I may add—to encourage the pursuit of fish under difficulties—that I do not remember to have lost more than one fish off the hook in all my battles up and down that dangerous reach. The rises were bold and sure, because the artificial fly was a stranger there—in fact I do not believe that anyone but myself had ever risked his tackle in such a spot. With an ordinary single-handed rod, however, success would have been impossible; I could neither have worked my flies nor controlled my fish. I used in those days a fourteen-foot double-handed rod of Eaton's, extra stiff and lengthened in defiance of all symmetry to suit a fad of my own. I fancied that the original hollow butt felt light and weak, and got the maker to shape me one nearly a foot longer and powerful enough to bear boring for a spare top. That rod, by the bye, is still forthcoming after forty-five years' hard work in many waters, and I wish its master were in equally good condition.

Thus far I seem to have proceeded without a due arrangement of my subject. I was tempted by my title to plunge as it were *in medias res*, and to show the purpose and conditions of fine and far-off casting. But as fly fishing was my theme I might as well, perhaps, have begun with the fly, the lure to which above all others the true angler loves to resort. The mimic insect is in every way interesting. The variety of materials now employed in its structure exceeds in these days even the extensive range suggested by Gay in his elegant description. Bodies of quill or gutta-percha were doubtless unknown to him, and the endless shades of pig's down and mohair. The many forms of gold and silver twist or tinsel which seem to have so great an attraction for the *Salmonidae* belong to a later date than his. And though he presses 'each gay bird' into his service, I doubt whether he would have known how to utilise the kingfisher's blue, the crest and hackles of the golden pheasant, or the killing plumage of the wood duck.

The Fisheries Exhibition brought out a wonderful display of artificial flies, English, Scotch, and Irish—I crave pardon of the judges for not having placed the Scotch flies first

—of every size, build, and colour. Indeed, as I ranged from case to case trying to form my own estimate of comparative merits, I felt tempted to exclaim with Diogenes at the fair, 'What a multitude of things are here of which I have no need.' Still the beauty, the delicacy, and in many cases the imitative skill of the work rendered the show very attractive.

Another source of interest in a well-tied fly, and notably in the very smallest, is its extraordinary strength and durability considering the materials employed. An angler must no doubt have tied many a score of flies for himself ere he can fully appreciate this excellence. In a case of flies set up for show it is assumed rather than proved to exist; but we may be sure that the exhibitor did not attain his reputation for such 'marvellous delicate ware'—as Queen Bess said of her first silk stockings—without producing an article capable of resisting both the strain of a good fish fighting for his life, and the repeated grinding and chewing of tiny teeth.

To build a salmon fly strongly is comparatively easy. There is ample room and verge enough for the firmest lapping of the hook to the gut, and for the tying-on in due succession of the various materials which form the body, legs, and wings of the highly composite insect, while the loop at the head, which was almost unknown in my boyhood, gives the needful strength at the point where the friction is greatest. But when we look at a tiny olive-dun or quill-gnat, such as often plays havoc among the heavy trout of our best chalk streams, we may well marvel at the skill which has made a few turns of fine silk not only join hook to gut indissolubly, but bind minute portions of various material together in a firm and shapely whole.

A trout fly, be it remembered, needs above all things to be strong. Neatness and finish may often be dispensed with, if the colours be only right, but strength is indispensable. Without it, the more attractive the lure, the more grievous will be the angler's disappointment. The points which are naturally weakest in the fly ought to be especially looked to. Judging from my own experience, I should say that four fish are lost from

the breaking or bending of the hook for one that escapes by the gut giving way. It is mainly with sneak-bend hooks that breakages occur, and these are apt to give way either just above the barb, or at the angle nearest to it. With regard to the number of flies to be used on a cast—a *rexata questio* amongst anglers—no really general rule can be laid down. In fishing a stream where the fish are large and the flies to be used small, it will often be found the best policy to use one fly only and that tied on a Limerick hook of the best make. Indeed, whatever the character of the stream, I prefer a hook of that class for my stretcher. It swims truer, and as it carries its point in the same vertical plane with the bend, seldom fails to hook your fish in the lower jaw. But on the other hand, there are many streams in which a second and even a third fly will greatly assist your basket.

It is not merely that you may please the trout better by offering them a choice, though this is obviously true, and doubly so where the water often changes its character. The motion of a dropper cleverly worked, especially over an eddy, is essentially different from that of the tail fly, and imitates a phase of insect life with which fish are familiar, that in which the fly keeps dimpling the water in a series of short descents, probably dropping an egg every time it touches the stream. The nature of this motion is well recognised by the term 'bob fly,' so often applied to the dropper, and the young angler will do well to study it carefully till practice makes him perfect.

If it wasna weel bobbet, we'll bob it again !

It is in this up-and-down play of the fly that the sneak-bend hook is so valuable, seldom failing to take hold somehow, somewhere. When it strikes on a bone, however good the temper, it is not unlikely to give way. But if care be taken to test each hook beforehand these mishaps will be very rare. If you have had a dozen flies dressed to your order, and cannot feel sure that the hooks have been carefully proved, try one or two by fixing the point in a board and giving a strong pull on

the gut. Twice in my life I have come to utter grief by neglecting this precaution, the flies being in each case only too attractive, but the hooks almost rotten. In one case I lost seven fish in the course of an afternoon, which would, I honestly believe, have weighed very nearly two pounds apiece. The other case, though less disastrous, was even more remarkable, as I was using a medium-sized fly on a Scotch tarn where the trout ran small. I took above a hundred, which would hardly have averaged five ounces, though they were strong and red-fleshed. But the way in which they 'chawed up' one particular batch of flies which I had had tied especially for small rocky lochs was really extraordinary. It seemed as if they crushed the hooks in their mouths. Full a score of my favourites came home to me broken at the bend, and in many cases I had scarcely felt the rise, so that several fish must have had their wicked will of the defenceless fly.

As I have already said, my losses through the breaking of the gut have been comparatively few, and almost always distinctly due to my own fault. The point of greatest danger is of course close to the head of the tail fly, where a momentary check takes place in the free unfolding of the foot links, even when the cast is most carefully made. The friction at this weak point is naturally increased when a fish is being played, since if he is firmly hooked the gut is apt to be strained when forming an angle with the wire. In dressing a large or a medium-sized fly something may be done to obviate this mischief by a few turns of fine silk set with copal varnish round the gut just above the head of the fly. But in mere midges—and it is with these that the greatest execution is now done in our best trout streams—this precaution is impossible.

It only remains that the fly fisher look often and closely at this critical point in his tackle, especially when the trout rise boldly and the fun is fast and furious. It is a great bore, no doubt, to have to change a killing fly at the first symptoms of 'fraying;' but a far greater to put on a fresh one when the first has been carried off by a good fish.

The special danger here indicated is likely ere long to be a thing of the past. The eyed hook is now in the field, and when perfected will render what is now the weakest point in the delicate gut required for trout fishing practically secure against irregular friction. But thus far the 'eye' appears too clumsy for the tiny flies which most require it. Had I to design an eye suited to the smallest hooks, I should borrow a hint from the needle-maker, forming the orifice for the gut like that in a small gold-eyed needle, though rounder, and lining it with some soft metal. The lapping at the head of the fly would thus be quite inconspicuous, while the shank of the hook would keep a true line with the gut. For the present, however, the 'capital' danger must not be ignored.

Every knot, again, is a weak point in the cast ; especially if tied in a hurry or not carefully soaked before use. A couple of spare collars which have lain in the slop basin during your breakfast may be carried round your hat with great advantage. Apart from an utter smash by bough or root—which is never impossible if you are in a hurry—it is often less troublesome to change the whole collar than to repair a trifling damage.

Having now dismissed the preliminary question of strength, I find myself face to face with the extensive and complicated subject of flies considered as lures ; of the best flies for use, and the circumstances under which these or some of these will be found most useful.

To this subject no single essay can do justice, owing to the number of flies which have a recognised value only within a limited district. But in order to deal with it at all, one must first encounter that *quæstio vexatissima*—Whether artificial flies, generally speaking, are imitations of some particular insect, for which they are taken by the fish, or nondescripts (to borrow 'Ephemera's' form of expression) which are seized only on account of their general appearance of life. The former position is generally maintained by English authors on fly fishing ; the latter by brethren of the angle north of Tweed, or among the mountains of North Wales. Now, that the artificial fly

should in general be an imitation, and on clear and often-fished waters a very close one, of some particular insect, I have no shadow of a doubt ; nor do I believe that anyone who has fished in the Derwent, the Driffield water, the Teme, or the Itchin, will hesitate to agree with me. Again and again have I found the 'March browns' supersede every other fly early in the season, when the natural insect, which I had imitated most carefully, floated on the water by thousands ; nor do I doubt that at such times Mr. Bainbridge's advice, to fish at once with three March browns slightly varied in tint and size, is most judicious. I have seen in like manner the little 'iron-blue' on a cold morning strong on the water, when I could not stir a fin with any other lure. The day warmed—a shower softened the wind—and the recent favourite was a useless appendage to my line ; while a larger, gayer insect, visible on the water, warned me, not in vain, that the 'yellow dun' must now be taken into council. How often, again, in July and August, do the artificial fern fly and ant fly—killing through the sultry hours while the natural insects are also conspicuous—give place towards evening to that late-fluttering tempter the red-spinner, whom I have dropped on the water scarce distinguishable among his living likenesses !

The green-drake,¹ again (better known perhaps as the 'May fly'), is a strong case in point. It is on the water little more than a fortnight, a large and 'ken-speckle' insect, and throughout that time it is very difficult, during the hours of its appearance, to induce a trout, in the streams where it is bred, to look at any artificial fly save a palpable imitation of this beautiful creature. To complete the argument, the same imitation is utterly useless on those English streams which do not produce the real insect.

Again, the experienced fly fisher will acknowledge the fact, that what the initiated call 'palmers' are taken, especially in

¹ It may be worth remark that, on the lakes of Westmeath (in this point very unlike those of Scotland), the May fly has its killing period, and, as in England, kills almost to the exclusion of every other fly.

swollen waters, in every river, and from the beginning to the end of the trouting season. Surely it is more than a mere coincidence that the rough caterpillar, or palmer worm, which these lures accurately resemble, should also be astir during full six months of the year, and be continually sent down the stream when a sudden rise of the water washes its margin?

To these examples, which I cited in favour of the 'imitative' theory nearly thirty years ago, I will add two or three more drawn from subsequent experience or overlooked at that time. There are certain flies tied in deliberate imitation of female insects carrying at their tails a ball of eggs to be dropped one by one in the water. I will instance two of these—the 'Grannom' or 'Greentail,' and the 'Governor.' The grannom—I speak now of the natural fly—is a reddish brown insect, not uncommon in the bushy reaches of many southern streams. It flies high, however, and so rarely touches the water that no artificial copy of it is in common use. But when the female fly develops her *ova* and is about to shed them she hovers close to the surface of the brook, with a green ball behind her, which may in more senses than one be said to wait upon her latter end. For as she drops egg after egg on the water, the eyes of hungry trout are soon attracted to her movements, and in some luckless moment of contact with the water she, with the portion of her rising family not yet launched on the world, disappears down a fish's gullet.

Now towards the end of April or beginning of May—for the breeding season of insects depends greatly on the weather—I often use the grannom fly, sometimes with signal success. But I have never done any good with it except during the few days when the female insect with her queer green appendage was actually visible on the water. The 'Governor' again—which should rather have been styled the 'Governess'—with its broad band of orange silk at the tail, represents another female fly generally seen on the water towards the end of July, conspicuous by a ripe cluster of orange-coloured eggs. Many practised anglers know nothing of this fly, but I have had the

luck to use it occasionally when the natural insect was strong on the water, and it was taken in preference to anything else. I may add that the heaviest take of large trout which ever came to my knowledge—though, alas ! I was not the captor—was made with this fly on the upper waters of Foston Beck, now in the hands of Colonel St. Quentin.

I might fairly rest my case on these two instances, in which the peculiarities of the natural insect during one brief phase of its existence are reproduced with such effect in the artificial fly. But I cannot pass by the 'local value'—to borrow an artist's phrase—of certain flies tied in imitation of insects unknown beyond a limited district. Every Devonshire man knows the virtues of the 'blue upright'—a dusky, smooth-bodied fly, varying from pale slate colour to a dead black. It holds, in fact, on Devonian streams much the same place as the murderous 'blue dun' with its downy body in a great majority of our English counties. Now on my first introduction to a Devonshire stream I noticed great numbers of a slender, active insect which had no representative in my fly book, and which I felt sure I had never seen before. But a local artist soon supplied me with the imitation I wanted, and since that time I have killed more trout in Devon with the 'blue upright' than with any other fly, and have seen the natural insect on every stream I have fished in that land of brooks. Surely this is more than a mere coincidence.

All this is so obvious, that my readers may ask how anyone could ever propose to question it? Yet in defence of the Scottish 'nondescriptarians' it should be said that they can tell of experiences much at variance with those on which I have built my inference. I have fished in some forty Scotch lochs or tarns, rarely without fair success, sometimes with brilliant results ; yet where the *Salmo fario* alone is in question, I have but half a dozen flies on my list for active service. Of these half-dozen two only, and those by no means the best, resemble any natural fly with which I am acquainted. I do not pretend to explain this fact, nor what mysterious harmony between a

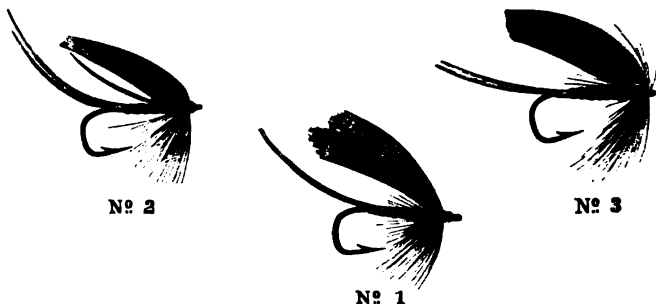
particular wing feather and a body of a particular colour renders their combination irresistible to the trout in so many lochs of the most dissimilar character. Still less can I tell why in one loch there is a standing *furor* for smooth silken bodies, in another for rough mohair and swine's down of the identical colours. Yet I have seen this deliberate preference for one or the other material proved beyond a doubt again and again. These and the like problems continually recur, and contribute to make fly fishing the intellectual amusement that many wise and observing men have found it. At the same time they warn us to beware of sweeping generalisations, and to gather our facts from a great variety of sources, ere we generalise at all. It is certainly curious that a dear relative, whom I 'coached' in the rudiments of fly fishing ere he became himself an authority on the subject, lays his qualified rejection of the 'imitative' theory at my door. I recommended to him my three favourite lake flies for use on a Scotch tour, and he found them so effective that he had them reproduced in various miniature forms for general use, and has certainly killed fish with them in waters where, from my own experience, I should have trusted to a very different cast. This, I admit, is curious; but it does not really affect the argument. To give it any logical weight we must beg the question of less or more; must assume that the system which was not tried would not have proved comparatively successful.

With this remark—which furnishes an answer to many fly fishers whose practice is better than their theory—I may dismiss this first of piscatorial *crucis*.

Having been for many years the willing victim of numerous applications for pattern flies on the part of friends, acquaintances, and even strangers bound for this or that fishing district, and having in a great majority of cases received the thanks of those who consulted me for the success of my prescriptions, I may be forgiven if I claim to speak with such authority as is due to long experience on the subject of Trout Flies for lake and river. For lake trout I have found, as already stated, that a very few

flies will answer every purpose, and I doubt very much whether three better patterns can be found than those recommended in the *first* edition of 'The Moor and the Loch.' With two of these I had been familiar before I read Mr. Colquhoun's work, my knowledge of the third—which has helped me to many a heavy basket—I owe entirely to his pages.

Without further preface, I will now describe six lake flies which in my opinion will meet all the requirements of the practical angler. They were all carefully dressed to my patterns by Mr. Charles Farlow.



1. Brown drake wing and tail, dark red hackle, orange body. This is, in fact, a 'professor' with a warm wing.

2. Grouse wing and tail, slate-coloured hackle, dark green body.

3. Jackdaw wing and tail, black hackle, claret-coloured body.

4. Strongly barred black and white teal wing and tail, bright red hackle, pale green body.

[This fly—if my memory serves me—was named 'Green-mantle' by the author of 'The Rod and Gun.']

These four flies—the first three being in my opinion decidedly the best—I consider indispensable for loch fishing. The size of the hook, the material of the body, and the amount, if any, of gold twist ribbed round the body or forming

a cushion for the tail, may be indefinitely varied, but the colour of the wings and legs needs no variation. I should class them all as 'nondescripts,' because, though bearing a general resemblance to insects occasionally seen, I have never caught on or near a lake a fly of which any one of the four can be fairly called an imitation.



Nº 5



Nº 4



Nº 6

5. Bright red landrail wing, yellowish red hackle and body. This fly is, I think, improved by a second hackle with some fine gold twist carried palmer-fashion down the body. Without this adjunct it closely resembles a red sand fly, larger and brighter than usual. I employ it only in lochs such as Ericht or Fruchie, where there is a fair sprinkling of char, for which loveliest of *Salmonidæ* it seems to have a special attraction, particularly if you sink it deep and move it slowly.

I was much struck a few days since by a passage in Mr. Black's 'Yolande,' where his hero casts expressly for a brace of char. He has perfectly worded the results of my own experience.

6. A wingless fly; black hackle, shoulders ostrich herl, body of warm orange silk. This fly I have occasionally found most killing, especially in rocky tarns, and in mountain streams with a bed of rock and stony gravel. I believe it represents a black-sharded, orange-bodied beetle frequent about such waters. I have named it 'Chaloner's Pet,' in honour of the inventor, a frequent angling companion many—can it be fifty?—years ago, and whom I still rejoice to hear of as wielding a deadly rod on Loch Awe.

A large alder fly, dressed as described at p. 289, might perhaps be added with advantage to the above list.

So much for lake flies.

The flies required for our British rivers and brooks are far more various, and depend for their success on minuter details of colour and material. Nor can any amount of general experience make the fly fisher perfectly at home on a new river, though it will prevent his feeling quite strange. I have killed trout in 130 streams (to say nothing of 50 lakes); but still, on water which I visited for the first time, I should be glad to take a hint as to the style of fly to be used for the nonce from any intelligent 'local practitioner.' The man of one stream, like the '*homo unius libri*,' is a formidable person within a limited range. On the same principle constant readers of sporting papers may benefit greatly by the recorded experiences of brother anglers on particular rivers. And I would recommend fly fishers, who have sufficient leisure, to 'book' accurately not only their captures but a brief record of the flies which on each occasion served them best, in order to prevent the results of their own experience from eluding their remembrance. Such a record is not the formidable affair it might appear at first sight. Three minutes at the close of the day will answer every purpose. I have been a working man all my life, and have, I believe, at least an average memory; yet I do not regret the time which, after every angler's holiday enjoyed during something like half a century, I have given to brief entries such as the following:

July 5.—Upper Ledditch. Warm day—light S.W. breeze. Red sand fly; orl fly (hackle) and *durk* coachman. Weight 10½ lbs. Best fish 15 oz.

By keeping such records one guards against false impressions as to the season and the weather when a particular fly did execution on a given stream; impressions which will often lead us wrong in our choice.

I shall not attempt any scientific classification of flies. But though I do not pretend to the character of an entomologist, it may be useful to beginners to remark that there are two great

families of flies to which the fly fisher's imitations chiefly belong : (1) *Ephemera*, (2) *Phryganea*. The *Ephemera* include a great variety of species, from the May fly to the tiny Jenny Spinner. They have a long life in the water as larvæ in the form of little green dragons, crawling about the roots of sedges and water weeds ; and a very short one as perfect insects, having their 'little day of sunny bliss,' during which the sexes mingle and the females drop their ova on the stream.

Under certain conditions of the weather they 'hatch out' from the larva state in prodigious numbers, leaving their empty skins, like insect ghosts, on rushes, flags, or waterside grass. I was once witness at Bray Weir early in July to a singular phenomenon in the shape of a countless swarm of 'Yellow Sallies.' They gathered over the Thames shortly before dusk, and formed a dense yellow cloud extending some 150 yards in length, 30 in breadth, and 3 in depth ; only a slight undulating movement in the mass, and the restless flashing up of scale fish from below to secure the stragglers who dropped out of the ranks, showing that what I saw was a prodigy of insect life and not an atmospheric phenomenon.

The artificial flies which represent the *Ephemera* are very various in size and colour ; but they are all alike in attempting to represent by the most delicate feathers—for the most part mottled—the gauzy wings of the natural insect. They are also alike in having three 'wisps' behind—single strands of hair or feather—to imitate the delicate filaments at the tail of the natural fly, which seem designed to steady and regulate the up-and-down movements of the insect, especially in the act of dropping its eggs. The feathers most used in dressing flies of this family are those of the wild drake (dark brown, pale grey, or dyed yellow) ; of the starling, landrail, snipe, and dotterel.

The *Phryganea* are a less numerous family, nor, as far as my own observation goes, do they ever appear on the water in such amazing swarms. They often, however, muster pretty strong, and certain species are continually 'hatching out' during a great part of the year from the bundles of vegetable

matter whence their name of 'faggot insects' is derived. The maggot-like larvæ form for themselves cases for shelter or security in which they dwell for many months before they quit the water and take the air as flies. They carry their wings when crawling—which they do much more freely than the *Ephemera*—not raised in pairs above the thorax, but folded pent-house fashion above the abdomen. The larvæ are commonly known as 'caddis' or case worms, and the abodes they construct for themselves, partly by the use of their strong nippers and partly by the aid of some natural glue furnished by their own bodies, exhibit a curious and interesting variety. These 'cases' ascend by a graduated scale from the simplest to the most complicated forms. First we have an inch of slender rush; then a more solid tenement formed from a piece of stick, in which the grub takes the place of the pith; then two leaves gummed together at the edges. Anon we find a fasciculus of tiny twigs, or a small clustered pillar of rush-rods, cut accurately to one length and curiously joined together. The most beautiful of all are cylindrical grottos, sometimes nearly two inches in length, formed of small fresh-water shells. A studious entomologist who was also a fly fisher might do worse than to make a collection of these ingenious dwellings and figure the 'imago' hatched from each. It would, I presume, be found that each class of dwelling belongs to a different species. I have found many kinds together in one spring ditch or sedgy backwater, so that there must have been a choice of material, though I cannot affirm that when I have dislodged the inmates for bait I have noticed any marked differences but those of size and colour.

It would be a curious experiment to transport a large number, say of the rush worms, to a stream where they would find no rushes, and then to observe whether, after the flies had hatched and bred, their progeny would disappear or would protect themselves by adopting some new building material.

But I am digressing. Let me return to my fly book, and say that the artificial flies representing the *Phryganea* have

mostly mottled brown or dusky wings, with dark legs and brown or yellowish bodies.

A third class of artificial flies—taking the term in its popular acceptation, without regarding the palpable misnomer—includes the palmers or rough caterpillars and the beetles. These may be usefully classed together, as they are formed of similar materials (the cock's hackle being generally dominant in both), and used in much the same states of the water. To these three distinct classes I would add for convenience a fourth or 'miscellaneous' class, comprising a great variety of insects not distinctively aquatic but occasionally attractive to trout and grayling.

I begin my list with the flies which I have found most useful all through the year on a great variety of waters; purposely limiting the number, in order that anglers who trust the results of my experience may, in the stocking of their fly books, avoid that *embarras de richesses* which will lead them to perplexity at the outset and useless changes in the course of a day's fishing. It should always be remembered that the fly is often blamed for the mood of the fish, and altered perhaps just when they are beginning to feed.

1. *The Yellow Dun*.—This fly is good throughout the trout season, and is taken freely by grayling in August and September.

2. *The Hare's Lug*.—This is the form of the blue dun with which I have done most execution through the year. In Wales, Scotland and the northern counties of England I prefer it to No. 1.

3. *The Marlow Buzz*, or Cockabundy (a corruption of 'Coch-y-bonddu').—This not only makes the best of droppers in rough mountain and moorland streams, where it is indispensable, but if tied very small and dark may be depended on in the clearest streams—those of Hampshire, for instance, or Derbyshire—especially when there are but few *Ephemera* on the water.

4. *The Red Sand Fly*.—I have found this fly very killing

from April to September in various rivers ; more so, however, in the midland and northern than in the southern counties. There is a small *ephemera* closely resembling it in colour, for which no doubt it is often taken. It kills best when tied with a body yellower than the landrail wings.

5. *The Black Gnat*.—This is generally considered a summer and autumn fly, and it is certainly most deadly just when the May fly has gone off. But if it be dressed, as I would have it, either with a dark wing or simply with black hackle



and ostrich herl, it will take well in spring—passing doubtless for Walton's 'black hawthorn fly.'

6. *The Partridge Hackle*.—This fly is rarely noticed by writers, but I have found it most useful throughout the season ; especially as a drop fly. I tie it with a soft-stemmed, dark-mottled feather and an orange silk body ; but I can hardly call it an imitation. It most resembles a large grey-winged gnat, like a miniature daddy-long-legs, which is often to be seen on waterside herbage ; but it is certain that good trout take it freely in all weathers, whatever they take it for !

7. *The Olive Dun*.—I have used this fly less than its excellence deserves ; but I know that it is A 1 in the chalk streams in any but very cold weather, and believe that there are few English waters in which it will not take.

8. *The Alder Fly*.—This fly kills well after the leaf is out, especially where the alder grows freely. The body is always of peacock's herl—the legs should be of a dark dun hackle. When it is tied on a large hook it wants a dark mottled wing, for which I prefer a brown drake or night-jar feather.



ALDER FLY



RED PALMER



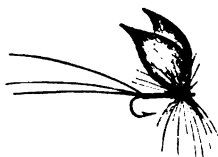
OLIVE DUN



BLACK PALMER



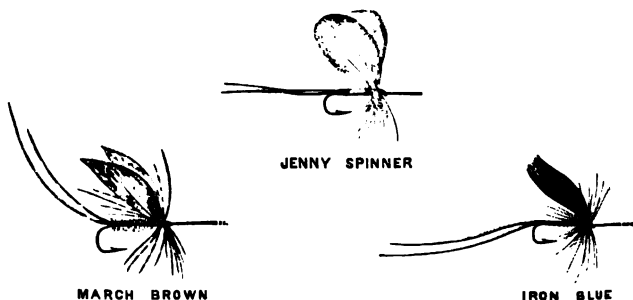
DARK COACHMAN



RED SPINNER

9. *The 'Dark' Coachman*.—As far as I know (but my study of books on Angling ceased some twenty-eight years ago) this is a hardly recognised fly ; but it is very useful, especially in western counties, and where trout and grayling are found together. It is simply the ordinary coachman—much used on summer evenings—with a starling's feather substituted for the white wing commonly in use. It is deadly in brooks throughout the year.

Add to these flies a Red and a Black Palmer (the former ribbed with gold, the latter with silver twist), for use when the water is beginning to clear after a spate, and you will be 'armed and well prepared' under ordinary conditions in an immense majority of British streams. I speak with some confidence on this head, as for many years I noted the flies with which I killed on each angling holiday, and still continue to record any new experience. The eleven flies named above—adding the Red Spinner (whereof hereafter) to make up the dozen—have certainly been answerable for fully three-fourths of my captures in brook and river.



Let me now say a word of the flies which, unlike those numbered above, have but a short reign, though for a time they can hardly be dispensed with. Of the March Brown and the Green Drake, which at once suggest themselves under this head, so much has been written, and in such detail, that I might fairly say, in the words of the briefest epitaph I ever read, 'Silence is wisdom.' I do not profess to be an authority in either case as to the much-discussed niceties of feather or colour, and will merely remark that in my own experience I have found both insects work better as hackles than as wing flies, and prefer them tied a shade under the natural size.

The little 'Iron Blue' is a very killing fly on cool April

mornings, and will take occasionally on cold days up to Midsummer.

The 'Jenny Spinner,' a still smaller and more delicate insect, appears at odd times on warm evenings, and will then kill in the lowest and clearest waters.

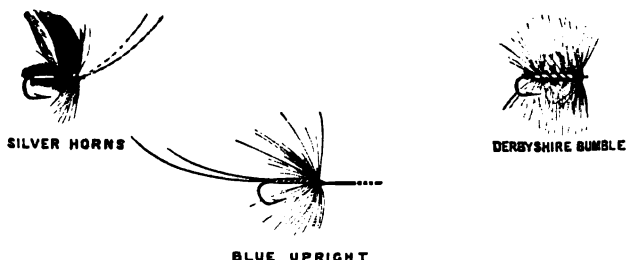
The Fern Fly I have found very taking, even at noon on sultry days in July and August ; but rather in still pools than in streams, and only in the neighbourhood of bracken.

The Red Ant Fly comes in very late—generally in September, when emmet flights are commonest—and is therefore rather a grayling than a trout fly. This fly, as also the Fern Fly, is figured in the list of grayling flies. In spite of its peculiar form, I have found the 'Dark Coachman,' tied small, an effective substitute for it. But of all flies which are not 'permanent,' like Miss Nipper, but 'temporary,' commend me to the Red Spinner. In warm evenings, far into the dusk, I have found it the deadliest of lures from June to September. Its whirling flight and its colour make it conspicuous ; but it figures in my evening cast whether I have seen it on the wing or not. Oddly enough, I killed my best fish with it in Tasmania. The fault of the ordinary imitations is that the bodies are of too crimson a tint. If you qualify the pure red, let it be with a little golden brown.

I might add to this list, but, after all, the real question for the practical angler is not so much how many flies he can utilise as how many he can safely dispense with. I have now only to notice a few important flies which have a purely local value, killing in one district, but being of little use beyond it. Lists of this kind are dry reading at the best, so to avoid tediousness I will name only three. The Blue Upright—mentioned already—is absolutely indispensable in Devonshire. It varies much in the tying as to size, build, and shade of colour ; its one constant characteristic being the hard smooth body. For general use I prefer it without wings, tied with a black hackle, not too stiff, and a slate-coloured body.

The Silver Horns I have found very deadly in Salop and

Herefordshire from the beginning of June. The natural insect is a small moth, glossy black, with very long black-and-white horns, easily imitated with a strand of a teal feather. It is very conspicuous on rank waterside herbage, and I rarely fail to use the imitation along sedgy reaches. Finally, there is the Derbyshire 'Bumble.' Of this queer fly I know nothing, save that I have killed with it, and have seen it successful in the hands of local anglers about Bakewell, Rowsley, &c. I have seen it tied with all manner of colours, but always with a fat body of smooth floss silk, ribbed with some bright short-stranded hackle. Its special oddity lies in its plumpness.



Seen in contrast with the ordinary Derbyshire flies—slender and almost midge-like things—it looks like Major Monsoon among a squad of light horse. What is it taken for? Not the veritable bumble, surely, which a trout rarely meddles with, and if in a whimsical mood he sucks it in, eschews without chewing. The 'great representative principle' seems quite at fault. Can it be meant for one of the local *Coleoptera*? Beetle—beadle—Bumble! A plausible derivation.

Having now given some general hints as to the best mode of fishing a stream, with some practical suggestions as to the choice of flies, I find that there is a good deal yet to be done ere the particular fish whom I have in my mind's eye takes up his proper quarters in the basket. My fly or flies are such as

ought to kill—whether they will do so, or be wasted as good meat is by a bad cook, depends on the handling of my rod. I have yet to throw over the fish, to hook him, and to play him when hooked. I would say a word on each of these processes, and do not despair of advancing under each head something at once new and true. This would be scarcely possible had writers qualified their general rules by drawing the requisite distinctions. We are told, for instance, to throw a perfectly straight line, that we may reach the farther and strike with the greater certainty, and I admit the general principle. But on a bright day and in a much-fished stream, such casting will not serve your turn, unless you aim at reaching an individual fish. Rather shake out your flies loosely, with a quivering motion of the rod, and let your links of gut drop lightly, in irregular undulations. The greenest trout, under such circumstances, takes alarm at a ‘straight line’ drawn across the surface of the water. Bear the same consideration in mind when working your flies down and across the stream.

Again, in throwing for a fish whose exact position you know, all the books tell you to cast two or three feet above him, and let the stream carry the fly down to the expectant trout—a good rule doubtless, for the general guidance of a tyro, but for the more advanced piscator, in sultry weather and bright shy waters, in place of ‘feet’ he may safely read ‘inches.’ It will not do *then* to let an old trout scan and study the insect approaching him. Drop the fly ‘reet ower his neb,’ as a young familiar of mine at Driffild used to phrase it, and ten to one, having no space for reflection, he will ‘take the death’ on the impulse of the moment.

Connected with the first dropping of the fly is the working of it on and in the water. Drawing it straight along, especially up stream, though common, is a ruinous error. In salmon fishing this is well known: the line is slackened at short intervals between the sweeping movements of the fly across and against the stream; and the lure is made lifelike and attractive by the alternate contraction and expansion of the

fibres forming its wings and legs. Let your trout flies be played upon a similar principle, but more variously, and more down stream. Let the tail fly seem struggling in vain to resist the current which carries him down, and the near dropper dip enticingly as if in laying eggs. A tremulous motion of the wrist is sometimes most alluring. In the stillest waters, on a warm day, I have killed good fish by throwing far, and then suffering my whole cast to sink ere I moved my flies. Trout will take them thus sunk if they do not see the ripple of the line at the surface.

We will now suppose your fish to have risen—the next point is to hook him, if indeed your line is not so taut that you feel he has hooked himself. To do this you must ‘strike,’ as the common term is ; which has been correctly, if not satisfactorily, explained as ‘doing something with your wrist which it is not easy to describe.’ Is this ‘something’ to be done quickly or slowly, sharply or gently? Not to distinguish too minutely, we would say, strike a salmon more slowly than a trout, a trout than a grayling, a lake fish than a river one, and, generally speaking, a large fish than a small one. As to the degree of force, a gentle twitch generally suffices—at all events, more is dangerous with any but very strong tackle.

Note especially, that in order to strike quick, you must strike gently. This requires illustration. Lay your fly rod on a long table, place a cork eighteen inches in front of the top ; grasp it as in fly fishing, and strike hard, making the butt the pivot. The cork will be knocked off by the *forward* spring of the upper half of the rod before any backward action can take place, and thus much time will have been lost before the line can be in the smallest degree tightened.¹ Remember, too, the great increase of risk to your tackle when the line is thus slackened before sustaining a severe jerk. Nine fish out of ten

¹ The remark naturally suggests itself that, if so, a strong forward movement from the butt of the rod, by producing a reverse action at the point, would be the quickest mode of striking. And this is mathematically certain ; but a trout so hooked would be immediately released by the slackening of the line when the backward reaction took place.

that are said to break the casting line are in fact lost by the eager violence of the striker, acting upon dry or ill-tied knots. I could say more on this subject did space permit. Thus much, however, as a parting precept. Never be in a hurry, especially when you see a good fish rise. Take your time, as he will take his, and the result will not disappoint you.

Our fish is now hooked, and the next question is how to deal with him. Some of our angling friends call this 'working a fish,' some 'playing'—the former term, perhaps, having an objective, the other a subjective reference. Nevertheless, *Halius* must sometimes work very hard, or *Salmo* will have the play all to himself. Two general principles may be laid down: first, the strain kept up on the fish should be the greatest attainable without overtaxing the strength of the tackle—which should be a known quantity—or the *hold* of the hook, which the most experienced angler cannot always calculate accurately; secondly, the direction of the butt should never make an obtuse angle with the line—in most cases a decidedly acute one. As for 'showing a fish the butt,' it is very desirable in general. But if you do so when fishing with a single-handed trout rod in a deep stream with hollow banks, you only aid that inward rush of your fish which is but too likely to wreck your tackle. Never bring your fish to the surface till he is quite spent; he may break the hold, if not heavy enough to break your tackle. Don't go trouting without a landing net, whatever certain writers of the rough-and-ready school may say. And if you have an attendant,¹ don't let him land your fish till you know that you can fully trust him.

Thus far I have dwelt wholly on what may be called the destructive side of the fly-fishing question, and have tried to show how the accomplished professor of 'Fine and far off' may

¹ [In many places, especially in Ireland, it is most difficult to get an attendant to stand still and allow the angler to bring the fish to him. Rushing down to or into the water with landing net or gaff is fatal, and loses many fish.—ED.]

surmount obstacles and profit by opportunities in the filling of his creel. But as the number and the skill of our fly fishers are continually increasing, the question still remains how the breed of British *Salmonidæ* can be kept up to meet the growing demand. Every true brother of the angle who pursues his pastime in a liberal and unselfish spirit ought, therefore, to direct his attention to the breeding and feeding of these fish, valuable as they are at once for sport and for the table. And it is important at the outset to draw attention to some conditions of this twofold problem which seem to be but imperfectly understood.

In the first place, the fact must be recognised that it is easier to keep up the number than the size of the trout in our best streams. Modern agriculture with its demand for thorough drainage tends to diminish the ordinary volume of water in our brooks and rivers. Fifty years ago, when there came a heavy spell of wet weather a great extent of spongy moor and meadow land along the watercourses imbibed and held up a large proportion of the rainfall. The spate came less suddenly and lasted longer, and in ordinary weather the banks continually gave out water to keep up the stream. Now it is either 'a feast or a fast.' The well-laid drains flush the rain water rapidly into the streams; the floods come down sooner and last for a shorter time, and the ordinary level of four-fifths of our trout rivers is very much below what it used to be when agriculture, though more thriving, was less scientific.

This diminution in the volume of water means, of course, a reduced supply of insect food for our trout. Nor is this all. Farmers and millers combine in many districts to keep the weeds close cut, and every weed-cutting destroys by wholesale the larvæ of those insects on which the trout depends most for his ordinary food. As I walk along some well-known beck and see huge heaps of water weed drying in the sun, I feel sorely tempted to use a naughty word when I think of the millions of possible *Ephemera* which have 'closed their little being without life,' hopelessly entangled in the ruins of their green abodes.

I know more than one trout stream where the May fly has disappeared within the last ten years, and have heard of sundry others. Of course this implies a diminution of the average weight of the fish in such streams, supposing their number the same. A fortnight's steady feeding on the grey and green drake used formerly to produce a marked improvement in the weight of the trout as well as in the colour of their flesh, so that those taken in the latter half of June with the black gnat or red-spinner were altogether a 'superior article.' Now, the larger fish are not at their best till the end of July or beginning of August, and the number of those which never get into condition during the fishing season, but remain, like the Ancient Mariner, 'long, and lank, and brown,' is steadily increasing, except in a few favoured reaches where there is a good depth of water with a strong sedgy border. I may remark by the way that the *Phryganeæ* appear to suffer less from excessive weed-cutting than the *Ephemera*; doubtless because their larvæ crawl about more in open spaces, and, from the protection afforded by their 'cases,' are better able to extricate themselves when hauled ashore in a mass of weed. The orl flies and caperers, for instance, keep their ground better than the more delicate flies of the *Caddis* family.

Reverting now to what I have called the twofold problem of breeding and feeding an increased stock of trout to meet the increased demand, I may state without hesitation that the difficulty in breeding fish in sufficient numbers will be far more easily overcome than that of feeding them up to a respectable size and condition. No doubt the shrinking of our brooks already alluded to has damaged many of the best spawning grounds, and exposed others in an increasing degree to the depredations of that worst class of poachers who destroy the fish on the redds. But, on the other hand, artificial breeding has for some years past been better understood and more extensively practised in the United Kingdom; and though we are still far behind the United States—and probably behind Canada—in this department of pisciculture, yet I think the

Fisheries Exhibition certainly gave a stimulus to trout breeding which will not only keep up the tale of fish in well-stocked waters, but restore a fair head of trout in streams whence they have almost disappeared. An interesting article published in the 'Standard,' on the breeding establishment at Howietown, shows that by the judicious outlay of a very small capital, millions of small fry may be yearly brought into the market at moderate prices and yet with a handsome profit to the breeder. We may, I think, assume that for the future there will be little difficulty in obtaining any reasonable quantity of stock trout from this and similar establishments. The chief question for the purchaser will be what size of stock will pay him best.

For a preserver who has, in connection with his own trout stream, the requisite appliances for 'hatching out' eyed ova, or feeding baby fish just freed from the umbilical sack, trout, in one of these two stages, will probably be the best investment. But for turning directly into the river the stock should be yearlings not less than five inches in length. They are easily moved if two conditions be borne in mind. First, the vessel in which they are carried should be smooth within, to prevent bruising, which is apt to set up fungoid disease; and, secondly, the water should be kept in motion, aërated, in fact, to suit the breathing of the fish. This, indeed, is the one indispensable condition for keeping the trout, in north-country phrase, 'wick and heerty' on their journey. The late angling editor of the 'Field' told me, as the result of his own experience in transporting fish, that he knew no better vessel for the purpose than the ordinary glass carboy used for chemicals. Its merit, I presume, lies in the perfect smoothness of the interior. Such a vessel, however, is fitted only for a *small* live cargo. As the removal of trout in large numbers becomes a more familiar process, we shall doubtless see in general use travelling tanks much like a modern watering cart, but provided with mechanical means for keeping the water in motion.

My attention was first drawn to this subject many years ago, long before I had discarded the spinning minnow for the fly.

I used to carry about a score of live minnows in a common soda-water bottle—just the glass carboy on a small scale—which I planted neck upward in my creel, with a notch in the side of the cork to permit free change of air. They never ailed anything¹ as long as I kept moving; but if I sat down for a meditative weed—and where can this be better enjoyed than in a shady nook by the waterside, ‘*Propter aquæ rivum sub ramis arboris altæ*’?—every minnow—out of pure cussedness as it seemed—would sicken in five minutes, and if I failed to notice the first symptoms would be ‘an unpleasant demp body’ in a quarter of an hour. Like minnow, like trout.

Some twenty years later, when I had been long familiar with the causes which made repose so fatal to my bait fish, I was actively engaged in a society for preserving the Thames about Marlow. Systematic poaching had made such havoc with those fine streams that a Thames trout had become a rare and almost legendary fish; and when we had put down our poachers and properly staked the ‘ballast holes,’ where they murdered our fish with the casting net, we found it necessary to restock the river. I obtained a goodly lot of trout from a Buckinghamshire stream some twenty-five miles distant, and had them brought to Marlow by no better conveyance than open tubs in a common cart, with floating boards to check splashing. The road was luckily a rough one, and the driver had strict orders—to say nothing of an extra fee—to keep continually at a jog trot, that the water might not stagnate. The fish all arrived at the Anglers’ Inn, Marlow (long may it flourish!) in perfect health, though sundry of them were large fish, weighing from two to three pounds. Our committee were then sitting, and after a glance at the tubs I went back to join them, taking it for granted that the trout would be at once turned in below the weir, according to instructions previously given. But after

¹ This is not strictly correct. They did occasionally—though why on one day and not on another I could never ascertain—turn red, in which state they were less attractive. But I found that by putting a little river mud into the bottle I could prevent this change, or cure it when it had begun.

some ten minutes it struck me as odd that I had not seen any of the tubs carried past the window. Jumping up and calling to the rest to follow me I ran to the cart—not a minute too soon. Half the fish—and all the large ones—had already sickened and were gasping side up. We hurried them in hot haste down to the water, and the fresh stream just saved their lives, one fish only proving past recovery. Five minutes more of still water, and the whole cargo would have been lost ; as it was, the introduction of those trout restored the breed which had become almost extinct in that fine reach of the river.

They were turned in, if I remember, about the end of August, after a season during which I could only hear of three trout killed by fair angling from Marlow Weir to Spade Oak. In the fourth season after, I took some forty myself, though hardly visiting the river twice a week.

I have told this story at some length to illustrate the necessity of keeping the water aerated by motion when stock trout are being transported ; but it may point another moral, viz. that it is desirable to use sizeable fish for restocking exhausted streams.

Let me add here, that I am by no means fanciful about stocking water, whether pool or stream, with what is called a 'fine breed' of trout. Such a breed results from centuries, perhaps, of superior feeding, and trout of such a race, if removed to waters where the dietary is less generous, will be apt to 'dwindle, peak and pine,' or at best will lose their distinctive superiority. On the other hand, fish taken from a hungry water and turned into one where the bill of fare is more liberal cannot fail to thrive. I have seen many notable instances where tiny brook fish, which at home would never have exceeded four or five ounces in weight, have been removed into a large sheet of deep water, and have there become large and good—worthy of an angler's respect and affection. I will mention two examples. On a high moorland beside Lartington Hall, on the borders of county Durham, runs a small burn—the same which, after gathering its dark peat-stained waters, plunges down romantic Deepdale to join the Tees above Barnard Castle ;

'scenes sung by him who sings no more.' On this moorland a large pool was formed, of perhaps thirty-five acres, its formation aided by the course of the burn. The moss-hags which had quaked along the winding banks of the streamlet were scooped away till the gravel below was reached, and the peaty soil was used to form a raised barrier round the extensive hollow, so as to deepen the waters still further. About five years after this artificial lake had been formed and stocked from the bit burnie that fed it, I had the permission of the owner, George Witham, Esq.—a name then well known in the scientific world, but my tale is some forty years old—to try the fly one summer's evening on its waters. I was very fortunate, either in my day or my choice of flies, or both; for though I had been told that the fish could rarely be coaxed to rise, I killed in a short evening's fishing, with my Scotch lake flies, eleven trout, of which the smallest weighed above a pound, the largest two and three-quarters.

I made a yet heavier basket in a rough afternoon the following year. Finer fish I have rarely seen, small-headed, hog-backed, and strong on the line. They took the fly in the grandest style; showing snout, back fin and tail, and coming *down* on their prey with such certainty that I missed but one fish in each day. The water, as well as parts of the bottom, being darkish, and the depth considerable, their outside hue was clouded gold rather than silver, but they cut as red as trout of the Thames.

I know a similar instance in a deep reservoir on the Brown Clee Hill, fed by a petty brooklet. The fish in the pool are Patagonians, and not more large than good—those of the brook of the small dimensions suited to their residence. Thus there is but one step between the two questions of breeding and feeding. A well-fed trout will, generally speaking, be a good trout, and a large range of water will supply its inhabitants with at least a respectable dietary. In this way mills do the angler good service; the fish in the mill dam have, so to say, a larger pasture, and mostly weigh heavier than those in the shallow reaches of the Thames.

The first and most obvious method, then, for counteracting the causes to which I have pointed as tending to reduce the volume of our streams and the amount of trout food which they supply, lies in deepening and widening portions of those streams. This can be easily done in many of our brooks, by raising barriers to hold up the water, and by enlarging and deepening portions of their courses at the small sacrifice of a few square yards of poor soil adjoining a natural hollow in their beds. The fish in the artificial pools thus formed will be better fed and consequently larger than those in the ordinary shallow course of the brook or 'pelting river'—to borrow Shakespeare's phrase—which favours the multiplication of trout but fails to supply them with abundant food.

Of course we must remember that trout water, whether pool or river, may easily be overstocked. In the course of a ramble through an unfrequented part of Lochaber, I once came upon a tiny tarn, fed by a burn which, though of the smallest size, afforded excellent gravelly bottom for 'redds.' I made a few experimental throws over it, and each time landed a fish on every fly. I added two small hackles to my ordinary cast of three, and had five troutlings hooked in as many seconds. I made a dozen more casts, and each time took five fish. They were so greedy that they *would* have the hook, so small that I had no difficulty in sending the whole quintett flying. Had I had any object in further slaughter—a feud with the cook at Inverlair, or an extensive contract for potted trout—I could easily, with the aid of my gillie to unhook the fish, have taken a thousand brace of these hungry fry in a day. Mine were perhaps the first artificial flies they had ever seen, for the tarn in question lies quite off the beaten track, though near Lochs Treig and Ouchan, which would have naturally attracted any wandering angler in those regions. But such a case of overstocking I never witnessed.

Within a mile or two, and on the same stretch of moorland, but at a lower level and where the depth of peat was far greater, lay another tarn of four or five acres in extent, which had no

'feeder' or possible breeding ground, and must have been casually stocked by some violent overflow of a neighbouring burn. I had heard of large trout in this, and tried it from mere curiosity, having never seen anything more dreary and unpromising, less like a Christian tarn than a reach of the Styx. I basketed five or six only; not that the fish were shy, but simply, as I fully believe, because they were few. They were all nearly of a size, above a pound and under a pound and a half; their outside colour pretty much that of a red Indian, and not unhand-some. But when sent up to table they proved simply uneatable, having the 'peat reek' so strong that I tasted one merely from a sense of duty, and dealt with the mouthful as Dr. Johnson did with the hot pudding—'A fool *might* have swallowed it.' Nothing better in flavour could have been expected from a mere turf hole, but the weight of these fish may illustrate what I have said of 'range of water' as conducive to size.

There are many large pieces of water, either altogether unused or given up to baser fish, which would carry a good head of trout. It is always assumed that these require running water, or at least a pool fed by a stream or spring. But if turned out young they will grow surprisingly in water absolutely stagnant but for a passing breeze or shower. I know a small pond in the East Riding with no feeder or outlet, much resembling the chalk ponds on the Hampshire Downs. It is irregular in shape, but in area about equal to a circle of thirty yards' radius; shallow at the margin, but deepening to a small island in the centre; the ground shelving towards it for some distance, so that a heavy rain soon tells on its level. Its ordinary inhabitants are numerous tench and gold-fish, with a few minnows of extraordinary size. Into this pond the owner, who is not only a skilful fly fisher but much interested in pisciculture, turned a few small trout from the Driffeld Beck as an experiment. Two or three years after I often saw a good fish rising near the little island, and about four years after the stock were turned in one of them was taken weighing 4 lbs. 7 oz. I did not see the fish, but was assured that he was in good condition.

He was turned loose again after a hasty weighing ; but he had seen his best days, and in the following season was finally drawn out a mere living skeleton. Under the circumstances we can hardly 'wonder a great trout should decline.' The wonder lay in the dimensions he actually attained.

In another case I stocked with tiny trout, caught with the hand from the very smallest of Kentish brooks, a little pool of about twelve yards by five, formed merely for picturesque effect in the beautiful grounds of 'The Hollands,' near Tunbridge Wells. Here there was a sort of feeder, but so small that an ordinary pitcher might during nine months of the year have received all that flowed in the course of a minute from the 'little Naiad's impoverished urn.' In the third year afterwards I tried the pond thus fed with extemporised tackle—a hazel stick, a line of Irish thread, and a glass minnow which happened to be travelling in my portmanteau. In less than half an hour I took two trout weighing $1\frac{1}{4}$ lb. each ; both well fed, handsome fish, firm and pink-fleshed.

I mention these facts because I would fain see trout more generally introduced into ornamental waters. For instance, I feel assured that the sheet of water in Battersea Park, if judiciously stocked with small fish from a small stream, would carry a good head of trout, whose movements would divert many a toiling artisan, unused to any nobler fish than a half-grown rudd. There are many of our canals in which trout might thrive. Within a few fields of the Driffeld Beck a notable example may be seen in a canal connecting the town of Driffeld with the Humber. Oddly enough, the natives always call it 'the River.'

Some forty-five years ago, in very bad fishing weather, I wanted to carry home to Hull an extra lot of fish, and thought I would try the river head at an hour when, according to my experience, brook trout are hardly awake. I took a fair stock of minnows with me, and made my first cast in the morning twilight, soon after four o'clock. Between that hour and seven I got three and a half brace of trout, averaging more than a pound and

a half, and decidedly better fed fish than those usually caught in the Club water even at that date, when minnows and May flies still abounded. A finer dish I have rarely seen ; but I was grievously vexed at not being able to beguile one 'most delicate monster,' weighing, I am sure, full nine pounds, who more than once followed my minnow but was too wary to take it. Two years ago I saw a seven-pound fish from the same water, in perfect condition, and I suppose a score or so of heavy fish are caught there yearly ; but there has been a great falling off in numbers. The size and flavour of these fish I attribute to the abundance of food.

All along the course of the canal, and especially about the locks below which the trout are mostly found, the small scale fish seem to crowd the water, and one might fancy a trout revelling without effort in one perpetual feast.

If the Driffeld folks had only enterprise enough to turn in, say, three hundred brace of stock fish every year, there would be more first-rate trout—first-rate both as to size and condition—caught in that short stretch of inland navigation than in an equal length of any English river with which I am acquainted.

There are doubtless other canals in which similar, though not equal, results might be attained. I remember formerly hearing of some good baskets made in one near Chirk. Of course, where there is a strong head of pike trout will stand but a poor chance ; otherwise, a canal carried through a good trouting country ought itself to be 'troutable.' It is, I repeat, a mere question of food, which will generally abound in large bodies of fairly clear water.

No doubt the angler in a canal, or in one of those waste reaches of water which border so many of our railroads, must forego the poetry of his craft. Not for him are the '*liquidi fontes et mollia prata*'—the gushing streams and flower-enamelled meadows which contribute so largely to the enjoyment of a fly fisher's ramble by brook or river. Yet to an artisan escaped from the weary town on a long summer's evening or a rare holiday, his sport will bring its own enjoyment.

and even its surroundings, if not distinctly picturesque, will have a certain rural charm. The level line of water along which he plies his craft has at least its green fringe and its border of fields to rest and refresh his eye ; and if along with a few fish for the 'missis' he can carry home a bunch of marsh marigolds or forget-me-nots, a yellow iris, or a spike of purple loose-strife for the 'kids,' he will be well pleased with his humble trophies.

Philanthropy in our England takes a thousand forms ; an association for stocking the open waters nearest to our towns with the best fish they are capable of feeding would be a beneficent and popular novelty. And I feel sure that if ever the experiment be tried on a large scale, no little surprise will be felt even by experienced anglers at the ease with which trout will adapt themselves to waters apparently unpromising.

I have pointed out, under the general head of 'Flies,' the chief ingredients of that insect diet on which trout so largely subsist. But as that diet is, for reasons already mentioned, becoming scantier in many of our best streams, we should do well to study the means of supplementing it with other kinds of food. It is, I am afraid, useless to attempt restoring the larger *Ephemera* in waters whence they have died out, drainage and weed cutting remaining the same. The flies are too delicate to be fit for breeding after a long journey, and it would be difficult to obtain the larvæ in sufficient quantities to give the experiment a fair chance of success. As regards the *Phryganea*, there are some neighbourhoods where a few sharp lads might gather 'caddis' almost by the bushel for turning out in the adjacent trout stream. But this could only be worth while in a land of spring ditches and shallow drains, and even then it is by no means sure that the stock of flies could be permanently increased.

In streams where the trout run large much might, I think, be done by providing them with cheap fish dinners. A trout over two pounds weight generally becomes 'piscivorous' if he

has a chance, and never attains so large a growth as when he is abundantly supplied with minnows or other small fry. It is true that a kind of 'stall feeding' may be pursued with great success. About the year 1840, a distinguished officer informed me that at a Waterloo Banquet which he had recently attended there were served up two trout nearly of a size, from the preserves of Sir Home Popham, near Hungerford, which together weighed 36 lbs. These fish had been fed on chopped liver, and my informant assured me that no salmon could be better eating. But a few years afterwards I heard of a still heavier specimen, weighing 23 lbs. 7 oz., sent up to London from the same neighbourhood.

This, as far as I know, was the largest specimen of *Salmo fario* on record in the British Isles.

A fish of twenty-one pounds is said to have been caught in the river Exe. I remember the capture—with pike tackle—of one over fifteen pounds in Marlow Pool, and have heard of other fish from the Thames that weighed eighteen pounds. The Driffield Club used to exhibit a stuffed seventeen-pounder, caught in days when there was a periodical migration of countless minnows up the various feeders of the 'Beck,' pursued by flights of the small black-headed tern or 'carr-swallow.' But till I hear of a rival candidate for first honours, I shall still say to that noble trout of Hungerford, '*Tu maximus ille es.*'

The system of feeding which gave him and sundry other stately 'bulks'—like Arac's brethren—to the market was briefly as follows. Two adjacent tanks—for the eaters and the eaten—were supplied by a running stream, and now and then a large hooped landing net with small mesh was dipped into the reservoir of bait, and its contents handed over to the cannibals hard by. Then ensued a grand scene: a dozen speckled giants appeared, rushing, plunging, gulping, wallowing, till the last victim had disappeared, when tranquil digestion became the order of the day. Under this system of training, a trout on a large scale, caught lank and lean after breeding, might easily double his weight in the course of the season. It should,

however, be remarked that much will turn on the smallness of the fry. Trout are sadly indifferent to family ties, but they will thrive on their infant grandchildren or great-grandchildren, whereas the occasional assimilation of an adult son or daughter will not keep them in condition. The heaviest meal will not fatten when it takes ten days to digest. Hence the great value of a good supply of minnows in a trout stream. Easily caught and greatly relished, they tend to check the practice of infanticide among elderly trout, while they are fattening from being readily digestible.

I have roughly guessed at two pounds as the weight beyond which a trout should not be wholly dependent on insect diet ; but they sometimes take to the minnow very early. I remember watching a fish on the upper waters of the Frome extremely busy among some fry just where a small drain joined the stream. I was fly fishing, but, failing to raise him, I caught a tiny stickleback, clipped off the spines, and threw it to him on a double worm hook like a fly minnow. He took it instantly, and on landing him I found that, though weighing little more than three-quarters of a pound, he had actually forty-six small minnows in his maw, the uppermost freshly swallowed, while those farthest down were more than half digested, and perhaps more numerous than I made them out by the tale of backbones. This fish, though he had taken to a minnow diet so young, was very thick and firm-fleshed.

But it is for keeping up the condition of really large fish that an abundant supply of minnows is especially desirable, and I would strongly urge proprietors and angling clubs to lose no opportunity of obtaining additions to the local stock. There are plenty of small streams and spring ditches where minnows abound, with no trout to keep their numbers down, and it will be best to obtain them from a great variety of waters. Care must of course be taken that no fry of 'scale fish' find a place among them.

Next to the minnow in value as food for trout comes that very 'delicate little fish, the stone-loach, or 'beardie,' the delight of

every urchin who has 'paidlit in the burn,' where it is found cuddling cannily under the shady side of a stone. Elderly trout pursue the loach most greedily, and seem to prefer it even to the minnow. I have never known the experiment tried of introducing it into a trout stream, though I have known several in which it was quite at home. But from the great variety of brooks in which it thrives, ranging from Scotland to Devonshire, I think such an experiment would be well worth trying. It would succeed, I feel assured, wherever there are plenty of gravelly shallows, broken by stones from the size of a fist to that of a brickbat.

The 'miller's thumb,' or 'bull-head,' has nearly the same habits as the loach, and is relished by trout in spite of his spiny shoulders.

Again, there are certain small crustaceans, popularly known as 'fresh-water shrimps' (*Cammarinæ*, I think, is their learned name), which are found in fine sand in sundry streams known for the firmness and flavour of their trout. But of the habits of these queer little wrigglers I know nothing. I have merely a general impression that they ought to be classed among 'movable feasts' for trout, with a vague hope that some brother angler with equal zeal and more knowledge will succeed in introducing them to new waters for the fattening of under-fed fish.

It is well known that small shell fish form a large part of the diet on which fish thrive in many celebrated lakes. Loch Leven may be mentioned as a case in point, though the area of the weed beds from which its trout pick their favourite food has been greatly reduced. The gillaroo seems to owe his special excellence to the same 'hard meat,' and I have little doubt that his distinctive gizzard is merely an organ developed in the course of many generations to aid in the crunching of shell fish. But I have never seen it suggested that the trout of our brooks and rivers have the same taste for these rough morsels. There is, however, one genus—that of *Limnæus*—several species of which might, I think, do good service in a trout

stream. One¹ especially looks as if it would be 'catawampously chawed up' by any trout of good taste. The shell is very frail, with a wide transparent lip ; and in warm weather you may see them by hundreds floating over the surface of a weedy pool with this lip upwards, surmounted and overlapped by a tempting expanse of soft, fat body, most inviting to any hungry fish. They are, it is true, chiefly found in still pools, but would thrive in the slow sedgy reaches and quiet backwaters of large streams.

This is not a mere conjecture of my own. A valued friend, the late Mr. Morton Allport, of Hobart Town, to whose judgment and energy Tasmanian pisciculture owed much of its success, imported a number of these shell fish soon after the introduction of English *Salmonidae* into the island, and watched their multiplication with great interest. He found that they would thrive in quiet streams, and showed them to me clustering round a bed of the English water lily. They were, in his opinion, excellent food for both trout and perch.

I have yet one more form of trout diet to mention which may surprise many of my readers. I speak of a certain very small leech, never, I believe, found in rivers, but abundant in sundry lochs. I must confess myself utterly ignorant of the laws which determine the habitat of these delicate crawlers, but I have found trout literally gorged with them who were far above the common standard in colour and flavour ; and were I about to establish a normal training school for *Salmonidae*, I would stock my lake or reservoir with a few hundred of these *hirudines*, obtained, e.g. from Llyn Manwd, near Festiniog.

I have gone into these details from a conviction that the trout fishing of the future must turn in great measure on the question of food, and that any and every means should be tried to increase the supply. In dry seasons, the upper waters of our streams require especial looking to, when they are too much shrunk to attract the fly fisher. It is occasionally necessary to move large numbers of the fish down the stream as its sources

¹ *Palustris* ?

fail ; but, short of this extreme case, a palliative may be adopted—more wholesome, I admit, than savoury—by a keeper who will condescend to details. A few of the crows, magpies, stoats, or cats, that have fallen victims to his professional zeal, may be hung on branches overhanging the water holes in which the fish are gathered to keep their enforced Lent, and a goodly shower of gentles will greatly soften the rigour of the fast. In fact, no source of supply should be overlooked.

Few anglers are unacquainted with the annoyance of frequent wasps' nests along the bank of the stream they are fishing. I have myself more than once been driven to ignominious flight from a promising pool, and the thought has come into my mind, 'I hope when that nest is taken its fragments may be thrown into the stream.' If anyone asks, 'Why, what's that good for ?' I reply with Shylock, 'To bait fish withal !'

GRAYLING.

I have thus far spoken almost exclusively of trout. The grayling, however, deserves more than a mere casual notice, and Cotton's ghost might haunt me if in writing of 'fine and far off' I ignored the fish he loved so well.

And indeed, 'for my own particular,' I greatly admire the grayling, who, I think, is less prized than he deserves. His beauty is the least of his merits—yet how beautiful he is ! Taken out of season—in June, for instance, or early July—the dull yellow-brown of his back and sides is not attractive ; but when he has recovered his condition, and adds the charm of colour to his always graceful shape—when he shows a rich dark tint down to the mesial line, and silver mail as bright as that of the salmon in level lines below, while his lofty back fin, like some 'storied window, richly dight,' transmits the sunshine through purple, red, and gold, no lovelier prize, save the rarely caught red char, can grace an angler's creel. The curious vegetable fragrance, again, whence he draws his name

of *Salmo Thymallus*, contrasts agreeably with the ancient and fish-like smell which clings to other finny captives.

For the table, I should place a well-grown grayling in autumn or winter above the average of river trout, while the 'shetts,' or two-year-olds, are in season all the summer through, and if judiciously fried are nearly equal to a smelt in flavour.

Cotton is in a measure right when he calls him 'the deadeast-hearted of fishes,' making 'no great stir' on the hook. He bores steadily down toward the gravel, working mostly up stream, but rarely making a sudden rush or attempting to weed himself. Yet even this dispraise needs some qualification. In small streams I have several times encountered grayling who fought for their lives with all the dash as well as the doggedness of lusty trout, though I have never met with the like in a large river. I might make a fair guess at the cause of this difference, but prefer to record the simple fact.

I have seldom fished for grayling with any lure but the artificial fly. To me, indeed, the crown of all fly fishing is a bright breezy day on the Teme or Lug about the middle of August, when the grayling are coming on and the trout not yet gone off. The sport is varied but almost continuous; there is seldom a reach to be 'skipped' on your river-side beat. From the dashing rapid haunted by trout you ascend to the steadily running ford, from two to four feet deep, in which you know that the grayling lie thick—'not single spies, but in battalions.' At the top of this again you come on a deep pool, with foam-flecked eddies where the trout reassume their sway, while on the confines of these different reaches you may hook either trout or grayling or both together. A brace of the former with one of the latter, or *vice versa*, make rather an exciting complication.

This delightful chapter of 'dual' captures ends with the first week of September; but there still remains a good spell of grayling fishing *pur et simple*. They draw together more and more in the quiet fords, and feed more boldly and continuously.

Sunshine sometimes appears to improve the sport, and on 'a glorious day in the golden-bright October,' with the most ordinary care in casting towards the light, you may not only take fish after fish along sixty yards of water, but on reaching the end may retrace your steps and fish it over again with equal success. When grayling are rising freely you may fill your basket in perfectly smooth water by a long cast with the finest gut.

A few words as to the style of casting which should be adopted may not be amiss.

In the first place, I care very little for up-stream or down-stream fishing when grayling are my object. I cast right across the ford, with just a shade of upward tendency. Whether in working the stream I shall move up or down its course will be matter of convenience depending principally on the sun and wind. Grayling being chiefly found in the lower and broader reaches of the river, and affecting the mid-channel rather than the sides, cannot be reached by the up-stream cast unless you are wading deep, and not always then. If you wade you had better move up stream yourself to avoid disturbance, but you will still, I think, succeed better by throwing across than ahead. Grayling being, as I have said, gregarious, you will of course greatly improve your chances by fishing with at least two flies, and in a fair-sized river I seldom use less than three. Here the cross-throw has an obvious advantage. I have killed doublets a dozen times a day, with now and then three fish at a cast.

'Fine and far off' should be the fly fisher's maxim with grayling even more than with trout. But not the less must he study to throw as little shadow as possible. The grayling lies chiefly in the open, and is easily to be approached under cover, so that everything may depend on your being on the right or wrong side of the water.

It should be borne in mind that the grayling shoots upwards at the fly almost vertically, and, if there is any eddy, often misses it. Throw over him again and again no matter how quickly; you will have him at last. I remember killing a good fish at Leintwardine at his eleventh rise. As to the life-like

working of the fly I have already said my say, and I will only add that in grayling fishing I repeat my cast more frequently, *cæteris paribus*, than when throwing for trout.

Of flies I have but few on my list, some of which I have named already as favourites with trout. Generally speaking, grayling flies should be small and of a marked character. Wren-tail with an orange body—a grand killer in Derbyshire—the fern fly, ant fly, silver blue and orange tag, with a small but showy red spinner for the evening, are all that I should specially recommend.



ORANGE TAG



FERN FLY



RED ANT



WREN TAIL



SILVER BLUE

Though I care little for grayling fishing except with the fly, I ought fairly to mention that the heaviest fish are caught with other lures. I have heard of very large fish *out of season* taken with trout flies in summer in the Test and Avon. But, putting aside these worthless captures, grayling of the very largest size are chiefly taken by 'sinking and drawing' with the artificial grasshopper, or with worm or gentle. For myself—and I think I have scored pretty heavily—the largest grayling I ever

took with the fly weighed but two pounds and three-quarters, nor do I remember to have ever raised a larger. They run much in sizes, and in the streams of Shropshire and Herefordshire, where I am most at home, the September fish, representing the well-grown 'shetts' of the previous year, run close upon three-quarters of a pound, while those a year older weigh about a pound more. These latter are really noble fish, and give excellent sport with fine tackle ; yet they fall far short of those killed with the gentle, especially when combined with that attractive lure, the 'artificial grasshopper.'

The heaviest basket I ever heard of was made at Leintwardine by the late Sir Charles Cuyler—a sportsman who had, I believe, no superior with the gun and very few with the rod. The exact weight, taken at one bout with the 'pointed' grasshopper, I cannot recall, but the best nine fish weighed twenty-seven pounds.

The grasshopper, as I tie it, has a plumpish body, ribbed with alternate strands of green and golden floss silk, with a narrow strip of fine quill or straw laid lengthwise on each side. The hook is about the size of that used for a small green drake, and along the back of it is lapped a small slip of lead, to facilitate sinking. Care should be taken that the bulk of the grasshopper may be chiefly at the back of the hook, in order not to interfere with the hold, and there should be room for a couple of gentles or a small worm-tail.

As the large fish suck this in after a most gingerly fashion, it is usual to have an inch or so of a small-barrelled quill, something like a miniature float, sliding along the line, just far enough from the hook to be always kept in sight during the process of 'sinking and drawing.' When a fish takes, this is seen to make a slight but sudden downward movement, so that the angler's eye gives him warning before his hand can feel the touch.

[Diagrams of the artificial grasshopper and float will be found in Mr. Pennell's article on 'Bait Fishing for Grayling.']

Were I deliberately pot fishing without regard for the

daintiness of my favourite sport, I could easily—especially in a bright low water—increase my take of fish by ‘pointing’ my fly hook. An ant’s egg serves the purpose well, being both cleaner and lighter than a gentle.

I remember early on a July morning mentioning this to a friend who was driving me over to Leintwardine. W—— had little hope of sport; the river was low, the fish shy; the grayling especially, he told me, were sulking in shoals at the bottom of the deep pools. ‘Were it not for your club rules,’ said I, ‘which you tell me are so very strict, you might pick out a few of those fellows by pointing your fly hook with an ant’s egg.’ He replied that it was not to be heard of, yet methought was rather curious as to the forbidden process.

We parted shortly after at the water-side, and before we met again in the afternoon I had a grand basket of trout. The river was so low that every stake showed; the fish came strong on the feed, and behind every stake I could see the suck of a goodly snout, so that a long cast up stream with my two-handed rod was absolutely murderous. W—— had done very little with the trout, not having fished so ‘fine’ or so ‘far off,’ and having been unlucky in his choice of water. But there were two or three really handsome grayling in his basket, against which I had nothing to show. I had killed the only one of decent size which I had seen rise during the day, and even he was no great things. Could it really have been *mea maxima culpa* that I had taken no fish like those before me? W—— answered my questions as to the fly he had used with an admirable steadiness of countenance; but when ‘still I gazed, and still my wonder grew,’ he could stand it no longer, and burst into that cheery ringing laugh which his many friends round the Clee will recall so well and so regretfully. It was impossible not to join chorus as he just articulated, ‘Ants’ eggs.’

The gentle, used by itself on a very small hook and thrown like the fly, is very killing, especially after Christmas, when breeding time draws near, and the grayling grow sluggish and dainty. The worm will kill through autumn and winter, and is

easier to manage than the grasshopper, as you may give your fish more time. But, after all, give me an open ford, a clear cast, and the artificial fly.

This irregularity of 'location' is very puzzling, especially when we consider how closely some of the streams whence they are absent resemble others in which they abound. The hypothesis which regards the grayling as a foreign fish, imported by the monks at some unknown date, seems quite untenable. It is, however, more to the purpose to inquire whether these valuable fish might not with advantage be introduced into many waters where they are hitherto unknown ; and on this question I have no doubts. Let us have grayling in as many counties as the nature of the streams will permit—at all events, in many more than at present. There are some first-rate trout streams into which, on the principle of 'letting well alone,' I should hesitate to introduce them, for fear of seriously reducing the supply of trout food. It should, however, be remembered that in shallow, rapid reaches of water, and wherever the stream is violent as well as deep, grayling will not rest. Nor do they ever work up stream, having (unlike the trout) a tendency to drop down from the upper stretches of water when these grow shallower till they reach the fords, when they find themselves at home—calm, even-flowing reaches, of moderate depth and speed. Thus the effect of their competition for food is necessarily limited, while the advantage of their neighbourhood to the trout—as, for instance, in the best Derbyshire streams—is found not only in the possession of two game fish for sport or the table instead of one, but in the extending the legitimate angling season through the autumn and winter months.

I have myself had no experience in the artificial breeding of grayling, and cannot pretend to say whether their introduction to new waters would be best achieved by this method or by moving a considerable number of moderate-sized fish. But with our present knowledge and appliances either plan might surely be carried out with little difficulty. If the fish are to be transported alive, the best time for their compulsory

migration would probably be the very close of the year, that they may have the advantage of cool weather for travelling, and time to settle down in their new quarters before the breeding season.

Had I the direction of a 'Grayling-extension' scheme, I should wish above all things, without prejudice to the claims of humbler streams, to have the experiment tried on a large scale in the Thames. If my memory serves me, a few were turned in near Reading some fifty years ago, but nothing came of it, though a solitary fish was captured three years after. To be successful, the attempt should be made in several successive years and in three or four well-chosen places. I have seen little of the Thames of late years, but having once known the river thoroughly from Streatley to Richmond, I can recall every feature of sundry reaches which formerly struck me as suitable for grayling. For instance, there is a fine ford immediately below Maple-Durham lock ; another about a mile above Spade Oak, where the old buck stage formerly stood at the meeting of the streams ; and miles of likely water between Maidenhead and Monkey Island. Penton Hook, again, though not clear in my mind's eye, occurs to me as fine grayling water, neither too brisk nor too dull. No doubt the pike in the Thames are a serious obstacle, though not, I think, an insurmountable one ; but, on the other hand, to introduce a new and valuable fish into the river beloved by the millions of London would be no trifling public service.

There are however plenty of other streams, from the lowlands of Scotland to Kent and Sussex, where the grayling might be introduced with every prospect of success. Among those nearest to London I should name the Stour, and perhaps the Darenth. The Driffeld Beck below Wandsford Mill seems exactly fitted to carry grayling side by side with trout.

But I do not pretend to enumerate the streams in which the experiment should be tried. I wish rather to set angling clubs and riparian proprietors to work in what seems to me a most promising field. Especially let it be remembered that the

grayling is rather a northern than a southern fish, and beyond the British Isles thrives best in high latitudes. I do not see why we should not have our finest specimens from the north of Scotland. At present I know but one stream where 'Thymallus' has been naturalised during the present generation—the Corve, a small tributary which joins the Teme at Ludlow. There may, however, well be others, as in a conversation a few years since with the Editor of the 'Field,' he told me of some grayling which he had recently transported by rail with perfect success. These fish, however, were destined for a southern stream.

Here I might fairly lay down my pen ; but age has its privileges, and holding with Cicero that the greatest of these is 'authority,' I am tempted to add a few miscellaneous hints on matters interesting to the angler, trusting that with a few, at least, of my readers, to whom I shall not be, like one of my ancestors, a mere *nominis umbra*, they will carry some weight.

And, first, as to tackle. Never buy a cheap rod ; it may be admirably finished, but the chances are against its being thoroughly seasoned. It is only the great houses that can afford to keep their staves long enough in stock to insure durability. Green-heart, and some American 'arrangements in cane and steel,' are now much in fashion, and I believe on report that you may now obtain a rod of greater power—especially for throwing against the wind—than those which have contented me. Still, sound hickory is not to be despised.

If you wish your rods to last long—and the two on which I depend have been in use fifty and twenty years respectively—look carefully to them at the end of the season. Let them be revarnished and relapped in the winter, and have all the rings save those on the butt moved some points round, so as to shift the strain and obviate any tendency to a permanent bias or 'cast' in the wood. A splice rod has more perfect play than a jointed one, and is worth setting up if you live on a river ; but otherwise the jointed rod of the present day, with ends care-

fully brazed to prevent swelling in the socket, and patent ferrules to save the awkward process of lapping the joints together, is a handy tool enough for practical purposes. On a wet day it is a good precaution to rub a little oil or deer's grease round the rim of each ferrule.

As for the reel, good ones are now as plentiful as blackberries. The circumference should be large and the barrel short, so that a single turn may gather in or release many inches of line. Multipliers might be pronounced an abomination, did not the proverb forbid our speaking ill of the dead. Anglers generally place the reel with the handle on the right, but I suspect the opposite practice is preferable ; the control of the fish will thus be left to the 'better hand,' while the left will suffice for 'pimming in' and 'pimming out.'

With regard to reel lines, I still adhere to the old silk and hair, but I can well believe that oiled silk, *sufficiently tapered*, is better in a high wind. Its weight, moreover, is a constant quantity, while that of silk and hair varies unpleasantly in rain and towards what I heard a Lancashire keeper call 't' faag eend o' t' dey.'

As to the gut collar, the question of 'tapering' is yet more important ; in fact, perfection in casting cannot be attained unless this be 'fine by degrees and beautifully less.' I have never bought any as perfectly adjusted as those I have tied for myself. But the graduated arrangement of the links is delicate and laborious work—more trying, I think, to the sight than even the dressing of flies, and the difficulty of the task of course increases with years. It is a good plan to have the gut sorted beforehand into distinct sizes—thick, medium, fine, and finest—and to tie a good many collars at one sitting when your eye and hand are in. Be very careful with your knots, and never attempt to make one till the gut has been thoroughly soaked in tepid water. Pay a high price for the best gut, particularly for picked samples of the finest. Engine-drawn gut is generally worthless ; single hair is far preferable—indeed, were not the docking of horses so universal, it might be often used with

advantage, as it falls more lightly, reflects the light less, and when taken from an undocked stallion is of such a length as to reduce the knots to a minimum.

The best chance of obtaining first-rate hair would, I think, be from some of the dray teams of great brewing firms. In some of our open northern streams good hair is invaluable. But it must be used with caution. Hair is very elastic, but will not bear a continued strain like gut. Leave it tied at a stretch, and it will shortly break. Hence, with even the strongest hair you must play your fish with a lighter and, so to say, a more variable hand than when using gut tackle. As for creels, a small one may do for brook fishing, but for use on good waters let it be roomy—enough so to hold at least twenty-five pounds of fish. I have not been specially privileged in access to the very cream of trout streams—have never, for instance, fished at Stockbridge or in the renowned Lathkill—have never had a day in the water at Cheynies, immortalised by that genial sportsman, Anthony Trollope, or in the upper waters of Foston Beck, admirably preserved by Colonel St. Quintin. Nor, again, have I ever had leisure to pick my days, but have taken my chances of a holiday or half-holiday when they offered. Yet I have not unfrequently filled a basket of the size recommended till it overflowed into my pockets.

By the bye, I think the form of the creels in general use a great mistake. They should be made much longer at bottom, so that a good weight of fish may be laid out without their pressing on each other, or being disfigured by bending. In an ordinary basket, the undermost fish on a good day are grievously crushed by the last comers—a sorry sight when laid out.

Questions of dress come near to those of tackle. A broad-brimmed *stiff* felt hat is your best thatch for all weathers. Wear woollen from head to foot, and knickerbockers with the thickest Inverness hose rather than trousers. If you have to wade, you must clothe your nether man accordingly; but do not wade oftener or longer than is absolutely necessary, espe-

cially when there are other anglers on the stream. If you 'establish a raw' on your foot, don't lay it up and 'swear at large,' but wash the place carefully, and clip away the loose skin. Then mix the white of a fresh egg with a few drops of brandy, and lay it over the bare place with a feather. When the spirit evaporates—as it will in a few minutes—a fine transparent film will be left. Repeat this process three or four times, and you will have a perfect artificial skin, which will neither wash off nor rub off. I have done a long day on the moors with such a false cuticle on heel and toe without pain or even inconvenience.

But your fly fisher must be fed as well as clothed ; and though by virtue of his healthy calling he ought to make a substantial breakfast, somewhere towards 2 P.M. (generally the slackest time of the day) he will feel that Nature abhors a vacuum. Something he must have in his pouch

Quod interpellet inani
Ventre diem durare.

What that something shall be must depend on his taste and the state of the sideboard. But if he inclines to the sweet simplicity of sandwiches, let him make them of ham sliced very thin, and overlaid with marmalade. The combination may seem startling, but will be found most palatable, particularly in warm weather. A layer of unpressed caviare, again, with a squeeze of lemon and a sprinkling of mustard and cress, though less substantial, has a pleasant relish.

As for fluids, during many years, when I was well up to the mark as a pedestrian, I found nothing better in a long day by moor or river side than an occasional mouthful of cold tea. But I would mention for the benefit of those who, like myself, are in the down-hill of life, that I have found a great resource against fatigue in a pocket flask of the 'Vin Mariani.' It is an extract of the 'cocoa leaf,'¹ the sustaining power of which (see Kingsley's 'Westward Ho !') has been for centuries known to

¹ *Erythroxylon coca.*

labouring men in Central and Southern America. There are many preparations, but I find this the best and pleasantest. It is procurable from Roberts, the Bond Street chemist.

The luncheon disposed of, there remains a high and doubtful question—shall Piscator smoke? I think the ayes have it. For myself, in spite of King Jamie and his modern supporters, I cannot dispense with my water-side cigar, especially on a hot afternoon. No one, I think, can fully appreciate the effect, at once soothing and restorative, of a well-timed weed, who has not enjoyed it in a tropical climate. Often after a weary ride through Australian bush, the glass standing at 110° or even 120° in the shade, my pulses throbbing and every nerve ajar, I have thrown myself from my horse, set my back against the shady side of a huge gum-tree bole, and after a few whiffs of a ready cheroot have felt myself calmed and refreshed ‘beyond the Muse’s painting.’

Even in England there is many a sultry afternoon when the fly fisher, after four or five hours on the water, will enjoy the fragrant leaf with similar zest. And, luckily, the hottest part of a summer’s day is usually a time when the fish are little on the move, so that he may have his smoke out without sacrificing his sport. Indeed, if he means to make a long day in July or August, he will often do well to prolong his rest, and while away an hour or two with a well-chosen pocket volume of Horace, for instance, or Boswell’s ‘Johnson,’ or Percy’s ‘Reliques’—anything that may be engaged by snatches, without continuous reading. There are times of sultry stillness when to offer a fly to the sulky low-lying trout is as useless as whistling jigs to a milestone. Nevertheless, the angler at rest will do wisely to keep his ears open, and to cast an occasional glance out of the ‘tail of his eye’ up and down the stream. Three or four heavy rises seen or heard in succession may give him unexpected notice that the fish are astir again.

And here let me remark, that there are few questions concerning trout at once so interesting and so difficult of solution as that which touches the times of their feeding; the hours and

days when they are likely to take freely. To the first part of the question it is easy to return a general answer ; subject, however, to frequent exceptions, due to what seems like pure caprice or 'cussedness' on the part of the fish. As a rule, from the beginning of April to the close of the season the surest hours for sport are those from nine to twelve. In spring, however, the fish often continue rising freely far into the afternoon ; whereas in summer, unless strong wind or heavy showers come to freshen them up, they mostly go off the feed between one and two, coming on again after a longer or shorter interval, and rising boldly from an hour before sunset to an hour after—as long in fact as you can see to throw. This, however, is only in warm weather ; if a dry cold wind comes up late in the afternoon your evening cast will disappoint you. Yet this only holds good as far as the Border ; in the northern counties of Scotland trout are almost invariably astir on a good ford towards dusk in July and August.

Looking far south again, I may remark that in Devonshire during the spring months something may always be done between 2.30 and 4 P.M.

So much for the 'happy hours.' I have still to inquire what constitutes a good fly-fishing day ; and my attempt at an answer must involve a sweeping confession of ignorance. Most anglers indeed will agree in praising a day of chequered cloud and sunshine, with a strong yet soft breeze from the west or south-west ; and there is no doubt that on such a day good sport is generally attainable and the fly fisher's craft is plied under the pleasantest conditions. Yet on shy waters I think I have made my heaviest baskets in a stiff nor'-wester with a dark sky and frequent bursts of heavy rain. The fish are thrown more completely off their guard and take the fly without misgiving as a battered and half-drowned insect. Larger flies, too, and stronger gut may be safely used.

Yet this only brings us to a conclusion which might have been taken for granted *à priori* ; viz. that roughened waters and dimmer light make it more easy to deceive the fish. But

an east or north-east wind very rarely produces the same satisfactory results. This may in part be due to the smaller show of the fly when the wind is 'snell and keen ;' yet this explanation hardly meets the case, as trout often take very well when flies are scarce. We may, however, assume it is a general though unexplained rule that a moist air is better than a dry one.

In waters with which we are familiar something may be learned from the colour of the surface. I was fishing long ago with my brother in Loch Fruchie, and taking fish, such as they were, very fast. Suddenly the old boatman said, 'Ye may pit doon yer gaud noo.' My brother to humour him at once laid down his rod. I being, rather what Mrs. Tabitha Bramble calls an 'imp-fiddle' in such matters, merely asked why? 'She's the wrang colour' was his brief answer ; and certainly, though the breeze continued, the aspect of the loch had become dull and sullen. I fished on, however, and in the course of the next hour caught one small fish, when the veteran very pointedly said to my brother—ignoring me as unteachable—'Noo, Mr. *John*, ye may tak yer gaud again.' And sure enough, the hue of the lake had grown brighter and livelier, and the fish came on the feed again.

I have borne this lesson in mind ever afterwards, and have certainly found that when the wavelets on a rippled pool show a blue or blue-black tint, there is sport to be had, but when they wear a dull leaden colour the fish sulk. *Why* they do so is another matter, as to which this deponent sayeth not. Again, after a rough stormy night, trout seldom rise well before eleven o'clock ; this, however, is probably owing to their having been on the feed all night.

The worst of all days, undoubtedly, is one when a thunder-storm is threatening but delays to burst. The clouds are piled in heavy masses, and every break in their array shows a lurid light gleaming through, of an indescribable tint between amber and lilac ; the air is hushed and still but for an occasional hot gust, which seems to come from nowhere in particular. You

feel oppressed yourself, and hardly wonder that 'the springing trout lies still.' Indeed it is a common apology for an empty creel that 'there is thunder in the air.'

But in truth when the storm actually breaks over you it gives you a grand chance of sport. I shall never forget a short bout of fishing which I enjoyed one evening just above Wansford Bridge. I had been early on the stream, though well aware from the aspect of the sky that my cake was dough till the threatened elemental war was fairly let loose. I worked my way doggedly down the beck, casting from time to time, as on Sam Weller's theory I might have eaten oysters, 'out of sheer desperation.' A few little fish I certainly took—they always *will* come when you have to put them back—and one solitary pounder, who must have been either eccentric or life-weary to rise on such a day.

But it was tedious work—the heat oppressive, the air dead. Even my attendant boy lost his faith in my star—took short cuts and long rests. I spun out my luncheon, smoked more than was good for me, and though I still held on for the heavier water below, I often doubted my weather forecast, and wished myself 'taking mine ease in mine inn.' But the stillness was at last broken by distant mutterings of thunder; the clouds banked up higher and higher, and just as I had reached the open water between Wansford mill and bridge the storm was upon me, with deafening peals and a slanting deluge of rain. Luckily I was waterproof, having one stiff cape over my shoulders and another buckled round above my hips and protecting me as far as my knee-boots.¹

The wind was too furious to permit casting, but as it blew directly on my back I had simply to let out as much line as I wanted and let it fall as I could. Never did I see good fish rise so fast. The fly was seized as soon as it reached the water, and the only difficulty in killing the fish lay in the violence of the wind. In less than an hour and a half I basketed twenty-

¹ I recommend this plan to all anglers; it is cooler than one long overcoat, and throws off rain without confining the perspiration.

one fish weighing twenty-eight pounds. This could not have been done within the time had I not, in anticipation of the wild weather, been armed with stronger gut and a larger fly than usual. Four-fifths of the fish were taken with the blue-bottle, an excellent fly towards the close of summer, when the natural insect goes daft (to use the Yorkshire phrase) and cannot keep itself from 'the drink.'

Many similar experiences have led me to the conclusion that in bright, shy waters a thunderstorm sets the big fish feeding 'owdaciouslly.' And it seems probable that the sudden changes in the mood of the fish which every angler must have noticed are due to the electrical condition of the atmosphere. It often happens that trout all at once cease rising, the river which just before was alive with rises becoming absolutely dead. In such a case an old hand will sit down and wait. Days may be better or worse, but there is hardly ever a day, except on a thick, rising, water, when the fish do not come on the feed at some time or times which the wary angler will not let slip. 'Tout vient à qui sait attendre.'

Even odder than the sudden sulking of trout is the fit they occasionally take of 'short rising,' when after every promising break you feel only a slight twitch, and never succeed in hooking your fish. Whether this is due to some ocular deception which makes them miscalculate their rise, or whether for the time they are merely amusing themselves with the fly, like 'MacFarlane's geese, that liked their play better than their meat,' I cannot pretend to decide. The fit seldom lasts long, and while it does it tries the angler's temper sorely. I remember once in a Devonshire brook raising from twenty to thirty fish in succession without a single capture. The sky changed, and I took seventeen without a miss.

This may show that after several failures a fly fisher should not conclude too hastily that he has 'tailored' his fish. They may never have had the hook in their mouths. When trout rise short, it is a good rule to give up striking altogether, and be content with keeping a taut line till some determined fish

hooks himself. If your fly be not hastily plucked away, a trout who has merely nibbled at the wings or tail may at a second or third rise 'go the entire animal.'

If you hook a fish foul—and the symptoms are not to be mistaken—risk your tackle rather than slacken your hold. He will never dislodge the hook unless by your timid handling. I once hooked a three-pounder near the tail—luckily on an open stretch of water—and held on to him till in his struggles down stream he swung in to the shore and was cleverly netted by a friendly looker-on, who had continually shrieked to me to 'give him line.' He dropped off the hook the instant he was netted, and I showed my friend with pride that there was a small scale on the point of the hook *below the barb*. The fish had been literally killed by the hold of the mere tip of the steel on his tough skin.

But I am running riot in old reminiscences. Happily, they are at least cheerful and blameless records, and raise no 'accusing shades of hours gone by.' No doubt, the fly fisher has what Mrs. Ramsbottom calls his 'little Piccadillies ;' he does sometimes fish a little beyond his liberty, and perhaps on a very bad day when he has landed a trout barely up to the mark in point of length gives the benefit of the doubt to the creel and not to the fish. But on the whole I have found my brother anglers worthy men and pleasant companions, with whom acquaintance readily ripened into friendship. Their quiet converse with nature seems to smooth down asperities of character, and they move 'kindly men among their kind.' There are few of them, too, who have not during their devious rambles noted something in the field of Natural History which they can impart in conversation. Speaking as one of the fraternity, I think the caution we most need is the time-honoured *Ne quid nimis*. The fly fisher's art is so interesting and so many-sided that its votaries are too apt to fancy themselves justified in making it a business instead of a recreation. I have known very clever men who devoted some eight months of the year to a series of 'fishings,' 'and to *salmon* gave up what was meant for mankind.

I am by no means sure that I should not have fallen into the same error myself but for the blessed necessity of work, early laid on me and scarcely abating with years. But I am very certain that had I done so I should have penned these pages, the records of my experience as a fly fisher, with regret instead of pleasure.

If I may venture a few 'more last words' to my brethren of the angle, they shall be echoes of a farewell uttered long ago.

Finally, pursue a liberal sport in a liberal spirit. Help a brother angler freely, especially when less able than yourself to afford a well-stocked fly book. Neither poach yourself nor encourage poachers by purchasing fish procured by doubtful means. Spare small fish (except in those over-stocked waters where all are small) and large fish when out of season, but not past recovery.

Abjure lath fishing, cross fishing, netting and spearing, and renounce salmon roe except to thin the trout near the spawning beds of salmon. And when you have filled your creel, maintain the old repute of the brotherhood by a liberal and not exclusive distribution of your booty.

So may your intervals of well-earned relaxation by lake or stream be welcome and fortunate. So may genial skies and soft showers add freshness to the air and beauty to the landscape. So may hand and eye work truly together, whether you wield the fly rod or lay it aside for the pencil. So may you return home unjaded from your sport, with a light heart and a heavy basket—happy, above all,

To know there is an eye will mark
Your coming, and look brighter when you come.

H. R. FRANCIS.

*CHALK-STREAM FISHING WITH THE
DRY FLY.*

THAT different rivers require different styles of fishing, or, in other words, that the highest art as practised in one locality is occasionally almost useless in another, may now, I think, be laid down as an angling axiom ; certainly it is a rule recognised in practice by, at any rate, most fly fishers of experience. On one river trout will take the fly 'wet,' on another it is almost essential to use it 'dry ;' whilst on some waters, like the well-known lakes of Westmeath, for example, the only time when anything worth calling sport is to be had is whilst the 'fly is up,' that is, during the season of the appearance of the May fly, and then the lure must be the natural insect itself used with a blow line. The extent to which these differences may exist in different streams is often only found out by the fly fisher through the disagreeable experience of empty baskets, on first visiting a new locality. Many and many a time has an angler, skilled in all the niceties of trout fishing in his own Highland streams, been utterly baffled when he first essayed his luck with the well-fed, not to say pampered, fish of Test, Itchen, or Kennet. And it is not difficult to find the explanation. The character of the clear chalk streams of the south is entirely different from that of the rocky mountain rivers and peat-stained torrents of the Highlands, and consequently the habits of the fish are also widely different. The chalk-streams are wonderfully prolific in insect life, far and away beyond anything of which the trout of Scotland or Ireland have for the most part any experience,

and besides the numberless flies bred in our southern streams, there is always an abundant store of larvæ, shrimps, water snails and other trout food which find their habitat among the weeds, to say nothing of minnows and small fry on the gravelly shallows. So that, with a large choice in their feeding, the fish soon wax fat and dainty, and while a trout in a rapid mountain or moorland stream has to be on the look-out all day long for anything edible which comes within his ken, and even then has hard work at times to keep himself in respectable condition, a chalk-stream fish is always picksome and hard to please, and will only take the fly when the natural insects are sailing down in goodly numbers. At other times he is either sheltering among the weeds, or else busy with bottom or mid-water food.

In many streams a judicious cast of three flies thrown into likely spots with a light and skilful hand will bring fish to the creel fast enough, but this kind of fly fishing for chance fish is seldom productive of any sport on a chalk stream. When, however, there is a heavy rise, and every trout is busily engaged in taking fly, it will be noticed that the fish take up a favourable position just beneath the surface of the stream, and feed steadily and persistently in the most quiet and deliberate manner possible. A movement of a few inches, a careful scrutiny, and a gentle unobtrusive 'suck' describes exactly the usual manner in which a chalk-stream trout takes his surface food. It is quite unlike the rush and the splash with which a Scotch or a Devonshire trout leaves the shelter of a submerged rock to secure the passing fly, and everything combines to make it difficult for the angler to keep out of sight, as well as to put the fly over the fish in an effective and natural manner. When a chalk-stream fish is feeding at the surface, the angler's fly is always brought into comparison with the natural insects floating down, and little sport is to be expected unless the artificial fly is most skilfully made and skilfully handled. It must be sufficiently neat and natural in appearance to deceive any fish, and it must be thrown so as to float 'cockily' like the real fly it is intended to imitate.

Frequenters of chalk-streams fish almost exclusively with a single dry fly, and only when the fish are visibly feeding at the surface. The angler selects his fish, gets behind him (that is, below him), and prepares for a cast up stream. Then taking two or three false casts in the air to judge the exact distance, the fly is thrown with the intention of making it alight gently a foot or two above the rising fish and *exactly in his line*, for a well-fed chalk-stream trout will rarely go even a few inches out of his way for a passing fly. If the fly falls short or wide, it should be left till the line has floated some distance to the rear of the fish, when it must be picked off, whisked through the air two or three times to dry the wings and hackle before a new cast is made. If there is no clumsiness several trial casts may be made before the exact distance is found, and the fish will go on rising undisturbed ; but the slightest bungle on the part of the angler is fatal and puts the fish down for the next half hour. If it be remembered that most of the best fish lie close to the bank and that the fly has to be sent down floating naturally correct to the very inch, it will be seen that there is room for great exercise of skill, and to succeed even moderately well requires a vast amount of practice.

It will always be a moot point how far it is necessary or not to present to rising fish an exact imitation of the fly on which they happen to be feeding. And the greater the experience of an angler the less will he be inclined to lay down the law on this and kindred questions : he will have learnt that his preconceived notions, based on extensive observation and practice, have frequently been completely upset by some sudden and unintelligible caprice on the part of the fish.

The anglers one meets on a chalk stream generally have some interest in entomology, and it is the exception for a skilful fisherman not to know something of the natural flies which tempt the trout to the surface. On the other hand, it is generally admitted that with a shy fish it is half the battle to put the fly right at the first cast ; in other words, a fish is often thrown off his guard completely by a well-directed fly, no matter what,

so long as it comes down exactly in the right spot before his suspicions are aroused by seeing a foot or two of glittering gut pass over his nose half a dozen times. So that there is a certain amount of truth in the saying, 'It is not so much the fly as the driver,' though the originator of this Hampshire maxim is himself quite as famous for his practical knowledge of flies and fly tying as he is for his skill in handling a rod.

But the angler who really desires to get the most enjoyment out of his sport will never be contented with the utilitarian view which measures a day's sport solely by the weight of the basket; he will always have powers of observation keenly developed, some at least of the instincts of the naturalist will be present, and the marvellous profusion of insect life—which is the peculiar characteristic of the chalk streams—cannot fail to excite his interest. And, other things being equal, there can be no doubt that the entomologist always has a great advantage over the man who knows nothing and cares nothing about the habits and life history of the flies of the streams he frequents. Moreover, there are some days, as all experienced anglers will admit, on which any efforts however skilful appear to be useless until the right fly is found. Then possibly, after an hour or more of fruitless whipping, the spell appears to be broken, and fish after fish falls a victim to the attractions of a single fly, the only pattern in the angler's store which for the time possesses any charm.

A certain amount of fly-fishing entomology may, of course, be learnt from books, but the only knowledge which can be really useful is that which the fisherman acquires for himself by his own habits of observation. The novice should, therefore, make a practice of studying the flies by the water-side; he will soon learn to recognise some flies at a glance, but, however proficient he may become, it is hardly likely that he will ever be able wholly to dispense with the useful habit of dipping up from the water a few of the natural insects, rather than fish for a moment in doubt or hesitation. To readily recognise the fly on which the fish are feeding, and to be able to match it with a good

imitation of his own making, gives a peculiar pleasure and confidence : if to this the angler can add the consciousness of skill and dexterity in the use of his rod, he may wander from stream to stream independent of local fancies and piscatory heirlooms, but with a good prospect of sport wherever he may find a rising fish.

The following is a list of the most useful flies for chalk-stream fishing. It does not profess to be exhaustive, but it will be sufficient, I think, to guide one who is strange to this style of fishing, and to enable him to equip himself with such flies as most southern anglers consider necessary. Several of these flies have already been described by me in the 'Fishing Gazette,' but recent experience has suggested slight modifications in a few cases. However, the patterns here given have all been put to frequent trial by experienced anglers on the Test, Itchen, Kennet, and other streams, and may all be relied on.

The numbers refer to the eyed-hook scale, which will be found at p. 20.

I begin with several dressings of the best of all chalk-stream flies:

I. THE OLIVE DUN.

- (1) *Body*: Olive silk. I know nothing better than Mr. Aldam's 'gosling green,' but it wants most delicate handling, and great care should be taken not to have too much wax on the tying silk, or it will darken the floss and spoil the fly. A ribbing of fine gold wire is an improvement.

Wings: Dark starling.

Legs and Whisks: Hackle stained olive—not too yellow, but a dull brown olive.

- (2) *Body*: Quill dyed olive, with or without gold tag. *Wings* and hackle as before. This pattern admits of several shades, and is, perhaps, the best all-round pattern that

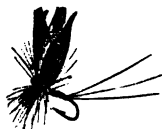
can possibly be used in Hampshire, from one end of the season to the other. It is always worth a trial. It is sold in thousands, and slays its thousands every year.

- (3) The same pattern as the last, with light brown fibres of hare's fur tied in for legs. Very good in April, and an excellent floater.
- (4) *Body*: Leveret's fur dyed olive, ribbed with gold wire. Hackle and wings as before. This is known as the 'rough spring olive.' A useful variety.

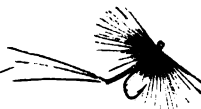
Hook, 0 and 00.



I.(5.) OLIVE DUN.



III. RED QUILL.



VI. RED SPINNER.

- (5) THE INDIA-RUBBER-BODIED OLIVE DUN.—This is a 'detached-bodied' fly (figured in the illustration annexed, the numbers corresponding with the numbers of the flies in this list), and if carefully made is a most killing pattern in April. Every year since I first discovered its merits on the Winnal Club water at Winchester I have found it useful, frequently killing with it when the usual favourites have been tried in vain over rising fish. The rubber body was not my own idea, though I believe I was the first to try it and prove its value.

The fly is made lighter or darker according to the colour of the rubber, and wings and hackle must be chosen to match the body. The hackle should be of a brownish olive to harmonise with the body, which, when held up to the light, has a translucent appearance, as like to the body of a natural dun as it is possible to

obtain. It is only in the early spring that I ever do much with this fly, and then I use it on a No. oo hook. It is extremely difficult to tie it small and delicate enough for summer use, but I have killed with it in August on a ooo, the smallest size made. For late summer and autumn I generally adopt horsehair bodies, as the hair can be dyed different shades, and can be used of a pale watery hue which cannot be got in india-rubber. I am never without a few of these detached-bodied duns, and they have again and again procured me sport when all else failed ; but it must be distinctly understood that they are only killing because of their close resemblance in colour and transparency to the natural insect. Some people seem to think that it is the detached projecting body which makes the fly attractive, and so they tie detached bodies of quill and silk, which are, of course, dull and opaque, and very inferior to hair or rubber. In fact, I consider it is labour wasted to tie detached bodies except of translucent material ; and if silk or quill be used, it is far better to use it on the hook in the ordinary way.

II. HARE'S EAR.

Body: Hare's fur ribbed with gold, and fibres picked out for legs, winged with dark starling. This fly is a great favourite on the Test.

Hook, o or oo.

III. THE RED QUILL, GREY QUILL, AND GINGER QUILL.

(*Vide engraving.*)

These flies are always useful, and they only differ in the colour of the hackle and whisks, though there is room for variety, if it be desirable, in the choice of quill. The red one has—

Body : Undyed quill.

Legs and Whisks : Red hackle.

Wings : Darkish starling. The grey and ginger are generally dressed with lighter wings.

Hook, o or oo, usually the smaller size.

The Red Quill is, perhaps, the best all-round evening fly that can be used in the summer months.

IV. THE IRON BLUE.

This fly comes out thickly on some parts of the Test ; it is less common on the Itchen, and in some places it is rarely seen at all. When it does come out the fish generally refuse everything else. It varies a good deal in colour, but I believe the best general dressing to be :

Body : Quill, dyed a dark blue with a violet shade. Some prefer mauve silk with mole's fur.

Legs and Whisks : Dark honey dun, the natural fly having yellow tips to its dusky blue legs.

Wings : From the breast of a water hen, or from the tail feather of the greater titmouse.

Hook, oo or ooo.

V. THE 'LITTLE MARRYAT.'

This is a fancy fly well known at Winchester, and indeed it is a prime favourite all over Hampshire. It bears a close resemblance to some of the pale watery duns which are always to be seen in warm weather. It begins to be useful at the end of April, and if dressed of suitable size it will do well from May to September, and will often kill the best grayling in October.

Body : Very pale buff opossum fur spun on light yellow silk.

Wings : Medium starling.

Legs and Whisks : The palest feather from a buff Cochin China cockerel.

Hook, o or oo.

VI. THE RED SPINNER.

(Fig. vi. p. 335.)

Of all the numberless patterns which have been devised to imitate the gauzy transparency of this fly, I believe this to be the best ; of late years it has been most successfully used in Hampshire, and is known as the ' Detached Badger.'

Body : Detached, made of reddish brown horsehair, and firmly whipped to the hook with strong well-waxed silk.

Legs and Wings : A 'badger hackle' dressed buzz. This hackle is difficult to obtain, and is of a rusty grey in the centre (almost black), with bright shining golden tips.

Hook, o or oo.

VII. WICKHAM'S FANCY.

One of the most useful flies that can possibly be used, whether for trout or grayling. It is always worth a trial, though what the fish take it for it is impossible to say. It is a very attractive, bright looking fly, and an excellent floater, but it sometimes does wonders in rough, wet weather, when dry fly fishing is hopeless. It should be made as follows :

Body : Gold tinsel ribbed from tail to head with red cock's hackle.

Wings : Dark starling. Landrail makes a nice variety.

Hook, oo to 1 or 2.

VIII. FLIGHT'S FANCY.

This fly hails from Winchester, and it is very useful towards the end of April, when the olives are beginning to get lighter in shade ; and all through the summer months a small ' Flight ' may be resorted to with confidence when delicate duns are about.

Body : Pale yellow, or primrose, floss silk ribbed with fine flat gold tinsel.

Wings : Light starling.

Legs and Whisks: Pale buff, or, for a change, honey dun.

Hook, oo or ooo.

With this list of flies a fisherman may consider himself well equipped for the first two months of the season, and there are many days in every month of the summer and autumn when these same flies tied smaller would be found sufficient to insure the best of sport.

I do not believe in dividing artificial flies according to months, and a good comprehensive assortment of spring patterns will, with slight modifications, always be of general use at all times and in all weathers. Still, there are some very favourite flies which do not appear before May, and as these sometimes entirely monopolise the attention of every feeding fish, they must be added to the list. I leave out the green and grey drake, as they are not found on every water, and almost every angler has his own special pattern; but, in my opinion, May flies are frequently tied too large, and I believe, whatever pattern be adopted, the best sport will be obtained by small flies.

IX. THE BLACK GNAT.

(*Vide engraving*).

The natural fly has a long, thin, shiny black body, not a bit like the fluffy little lump usually seen in the imitation. Then



XVII. JENNY SPINNER.



IX. BLACK GNAT.



XVIII. THE INTERMEDIATE.

the wings are long and lie folded *quite flat* (not sloped like those of a sedge or alder), and projecting over the tail end of the body, showing a shiny, metallic, gauzy film, in strong con-

trast to the black body, and which cannot be imitated by feather.

This is how I make my pattern. On a oo or ooo hook I put a longish body of black ostrich herl, which has first been stripped. Then I cut a strip of pike scale the proper length and shape to represent the two folded wings and tie it flat on the top of the hook, taking care to show the projecting bit above mentioned. Then over and in front of the wing I take two or three turns of a small black starling's feather, and the fly is finished. It does not float very well, but in fine still weather it is very effective ; and the pike scale, tied as I have described, will stand a great deal of whipping.

Those who object to the pike scale wing can substitute starling feather, but the fly will be less lifelike, and on a hot August day certainly less killing.

X. THE SEDGE.

The last two or three seasons this fly has not preserved its reputation as a standard pattern for late fishing on a summer's evening. It has been a mystery to many who used to look upon it as a never-failing resource. A few years ago it killed splendidly at Winchester ; and I remember seeing a man come to the Old Barge stream, at eight o'clock one evening in August, and kill five brace of good trout with his favourite sedge. He rarely used anything else in the evening ; and I, myself, at that time fished it with more confidence than any other fly. But I have done very little with it lately, and my stock of sedges has not wanted replenishing for a long time.

When the trout and grayling return to their old tastes, the following will probably be found the best dressing for the sedge and its variations :

(1) THE SILVER SEDGE, which I believe is no sedge at all, but

an imitation of the small grass moth which flutters about in the meadows by the riverside.

Body: White floss silk, ribbed with silver; hackled all over with buff or light red hackle.

Wings: Landrail.

Hook, 00 to 1.

(2) THE RED SEDGE (or, Sedge proper).

Body: Red fur from hare's face, or fox's ear, or from the reddest part of an opossum skin. Rib it with gold thread and wind on a red hackle from tail to head.

Wing: A ruddy feather from a landrail's wing.

Hook, 00 to 1.

(3) THE BIG SEDGE.—This is the local name, but I prefer to call it the 'Cinnamon.' It is a fat, toothsome morsel, nearly an inch long, and answers capitally on a moonlight night, when it is warm, still, and free from mist. I have killed many heavy fish with it, especially in September, during the harvest moon.

The dressing I prefer is the same as that given for the red sedge, on a No. 2 hook, and winged with the reddest part of a cock landrail's wing, or, better still, with one of the under covert feathers of the peahen, which are very faintly mottled with a darker shade of brown.

Though true to nature, I think it is a mistake to dress the body thick, for the fly is apt to be heavy and lumpy, and so float badly.

XI. THE ALDER

Is very useful in June, and on some rivers will kill in the May-fly season better than the drake itself. It is in great favour with the Fairford anglers, and the natural fly is very plentiful on the Colne.

Body: Bronze-coloured peacock herl.

Hackle : Black, or a dull-coloured feather, with black centre and ruddy tips.

Wings : From the tail feather of a hen pheasant.

There is another very good variety known as the 'Button,' or 'red-winged alder,' which should be dressed as before, only that the wing should come from the red tail feather of a partridge.

Hook, No. 2.

XII. THE BROWN QUILL.

Very useful in August and September.

Body : Some light quill dyed in Judson's light brown. Very good imitations have been produced by taking ordinary peacock quill and bleaching it.

Legs and Whisks : Ginger.

Wings : Medium starling.

Hook, oo.

XIII. THE INDIAN YELLOW.

Body : A delicate brown silk ribbed with bright yellow.

Legs and Whisks : A rich buff.

Wings : From the under wing-feathers of a *young* grouse.

Hook, oo.

This fly has a very prominent reddish brown head, which may be imitated by a couple of turns of dark orange silk.

The grouse feather is the right colour exactly, but it is very soft, and makes a poor wing for floating. It is a pity some other blue feather cannot be found suitable for this fly and the next.

XIV. THE BLUE-WINGED OLIVE.

This fly is larger than most of the duns of the summer months, and generally makes its appearance just at dusk, when it sometimes comes out in myriads.

At Winchester in September I have seen the river covered

with it, and rising fish only a few yards apart as far as one could see. Some of the heaviest fish I have ever killed in Hampshire have been taken with this fly ; still I have never been satisfied with any of the imitations I have yet devised.

The body is of delicate greenish olive, legs a pale watery olive, and the wings distinctly blue, like those of the Indian yellow. I have made the body of silk, wool, dyed fur, ribbed with gold, and with quill of different sorts. I hope some day to hit off the right shade in dyeing fibres of the condor's wing feather, and also to discover what will make the best wing. Possibly the blue feather from a merlin hawk's wing might do, or perhaps the coot's wing might solve the mystery. It must not be a soft feather which sucks up water and gets sodden directly, for the natural fly sits up and rides cockily on the water, and no half-drowned imitation can ever do much execution. I am convinced we have not got the right pattern yet.

Hook, o or oo.

XV. THE LITTLE SKY BLUE.

This is a splendid grayling fly in August and September ; in fact, all free-rising fish take it well in the warm autumn mornings from ten to midday.

Body : Pale straw colour, of silk, quill, or fur. I have killed well with all three, but silk I like least, as it changes colour after it is wet much more than other materials.

Legs and Whisks : Light honey dun.

Wings : A pale delicate blue, best imitated with a jay's wing feather.

Hook, oo or ooo.

XVI. THE RED TAG.

This is generally regarded as a grayling fly, but at times it does wonderfully well among trout. The brighter the day and

the hotter the sun the better does this fly succeed. It is not generally known that when trout are 'smutting'—i.e. feeding on that tiny black midge which baffles all imitation—they will often take a small red tag ravenously. On one of the hottest days in August 1884, fishing at midday, I hooked eight large trout with the red tag, and this on a piece of water which it was usually considered hopeless to fish before dusk. As for grayling, when they are lying basking on the gravel in about two feet of water, the red tag will almost always bring them up. I have had splendid sport with it on many occasions. This is the dressing :

Body: Peacock herl, short and fat, with a tiny red tag of floss silk, wool, or scarlet ibis feather. Floss silk looks very well when it is dry, but it shrinks up when wet, and often loses its colour ; I have always found wool much more killing.

At the shoulder should be wound a dark, rich, red hackle.

Hook, o, oo, or ooo.

XVII. THE JENNY SPINNER.

(Fig. xvii. p. 339.)

This is the transformation of the iron-blue dun, and is one of the most beautiful and delicate flies to be found by riverside. It is often seen dancing up and down in thousands after a hot day, and the fact that it is by no means uncommon on rivers where the iron blue is scarce, leads me to think that some other summer duns (possibly the little sky blue) turn to this delicate transparent spinner. It is impossible to see it on the water, and at best it is a most difficult fly to imitate. For these two reasons sport with it is somewhat uncertain.

It should be dressed with a detached body of white horsehair tipped with a couple of turns of mulberry silk and white whisks. Tie the body to a oo or ooo hook with mulberry coloured silk to show the head and thorax

of that colour. Wing it with two hackle points from a very pale blue dun cock, almost white, and let the legs be of the same colour. Or it may be dressed buzz with a pale grizzled hackle, like the red spinner, No. 6.

XVIII. THE INTERMEDIATE.

(Fig. xviii. p. 339.)

I use this name to denote a class of delicate flies which I use with considerable success in summer fishing.

Everyone must have noticed how the different duns seem to run by different gradations from one kind into another, so that sometimes a fly picked off the water cannot definitely be named according to any of the standards of classification, and yet it bears a considerable resemblance to several flies we are accustomed to call by name. I have found it very useful to tie various horsehair detached bodies of pale and delicate tints, and then match these with wings and hackle ; choosing different shades of honey dun, light buff, or olive for legs, and varying the colour of the wings so as to suit the rest of the fly.

I take immense pains over these patterns, and, by constantly studying the changes in the natural insects, am enabled to produce delicate and life-like artificials which frequently bring a good fish to my basket after he has steadily refused to be tempted by other flies.

This list is, I think, comprehensive enough. Some will think it needlessly long, and others will miss some favourite pattern of their own special fancy. But, in giving my opinion on the subject of flies, I have described those which my own book contains, and a supply of which I always like to keep up to working order. If they are dressed of suitable size, and are used with fine gut, they will suffice to give sport if sport is to be had. Anyone who fails with such a list as this will, I am convinced, find fly fishing generally an unprofitable pursuit.

*SPINNING AND BAIT FISHING FOR
SALMON AND TROUT.*

I TAKE up the subject of fishing for the various species of *Salmonidae*, migratory and non-migratory, at the point where it has been left by Major Traherne, Mr. H. R. Francis, and Mr. H. S. Hall in their able articles—namely, where fly fishing ends and bait fishing begins. In the term ‘bait fishing’ I include everything except fishing with the artificial fly, and embrace spinning as well as shrimp and worm fishing.

For convenience of reference I shall divide these subjects into their ‘specific’ variations as follows :

Spinning for salmon.

Worm fishing for salmon and bull trout.

The prawn or ‘shrimp bait’ for salmon.

Spinning for lake trout.

Stream minnow spinning for brown trout.

Worm fishing for brown trout.

Creeper, and stone-fly fishing, wasp grubs, &c.

The subject of Thames trout fishing is treated of in a separate article from the pen of Mr. H. R. Francis, in whose references to grayling fishing will also be found some additional notes on bait fishing for grayling with the gentle and artificial grasshopper.

SPINNING FOR SALMON.

All minnow spinning for salmon, whether in lake or river, is in my experience very much a matter of locality. That is to

say, in other words, that it is only in certain rivers and lakes in which the spinning bait can be used with any probability of success. For example, on the Clare-Galway river, which debouches into Loch Corrib, when there is a little freshet on in September or October the spinning eel-tail is considered the most attractive bait. On the Tweed, again, the real minnow, spun as I am about to describe, is most deadly, though, unfortunately for the spinner, not allowed, I believe, to be used. On the Aberdeenshire Dee, again, where it is permitted, the minnow is exceedingly effective, whilst on other waters, as, for example, on the Awe and Lochy, two of the most celebrated salmon rivers of Scotland, it is of no earthly use, and the minnow spinner might, for all practical purposes, as well fling his hat in. Still, as I have said, there are some salmon waters, and those good ones, where the spun minnow is an exceedingly deadly bait, and a few hints as to tackle and the best mode of using it, may, therefore, not be unacceptable.

With regard to the eel-tail bait, to which I have already alluded, this is best made from the last 3 or 4 inches of the tail of an eel 11 to 14 inches long; and the best way to apply it is as follows:

Skin the said eel¹ downwards to the 3- or 4-inch point alluded to. Cut the body off there, together with a small piece of the spine bone below the level. Then pass a large salmon hook in at the orifice, and run it down the middle of the tail (until the shank is entirely embedded in the fish) bringing the point out about one and a half inches from the end of the tail, so as to make the bait follow the curve of the hook. Now tie the loose skin tightly and closely round with a piece

¹ HOW TO SKIN AN EEL.—Having killed the eel, which is done best by dashing it down hard two or three times on a flagstone or other hard flooring, make a circular incision through the skin below the pectoral fin, by passing the blade of a sharp penknife under the skin, bit by bit in a circular direction. Then 'pin' the head of the eel down to a table with a steel fork, and having got hold of the edge of the skin with the finger nails, and turned it down a little way, take hold of it with a dry cloth, and it will generally peel off with ease.

of waxed silk just over the top of the hook shank ; then turn it downwards towards the end of the tail, and cut it off all round at a point about an inch from the last-named lapping. Now sew the rough edge of the turned-over skin carefully down with Holland thread, or, perhaps, better, red sewing silk, and the bait is complete.

I have found it convenient, in order to make sure of the bait not slipping down over the hook, to put a small pierced shot above the top of the latter on the trace. The first tying of the eel skin being made above this pierced shot makes it impossible for it to slip down. If the bait is nicely made in the proportions that I have described it ought to spin excellently well on any ordinary spinning trace, which should, of course, consist of salmon gut. The inside colour of the eel skin is blue, and this, so far as the turned-over portion is concerned, becomes the outside on the bait, forming a very good head. It also, of course, materially increases the durability of the bait.

Mr. Hughes, the well-known fisherman of Galway, who was a great proficient in this mode of spinning, was in the habit of keeping the eel for three or four weeks in plenty of dry coarse salt before making up the bait. He was of opinion that it rendered the skin both tougher and bluer. If this salting process is gone through it should be soaked for some hours in fresh water before being baited with in order to make it plumper and better filled out. The eel-tail bait requires considerable nicety of construction, and should always be made, if possible, before starting to fish. Two or three baits at the outside ought to be enough for a day's fishing, barring break-ages. If not lost or used, they can be preserved in dry salt for another occasion.

The salmon will also occasionally take the parr tail or a *very small* trout, three or four inches long, or a loach, or other spinning bait used in the ordinary way ; for which, as also for the flight, and for the trace applicable to the eel-tail bait, and generally for the *modus operandi*— in which there is, so far as

lakes are concerned, little appreciable difference—the reader is referred to the article on Lake Spinning for Trout.

I used to be of opinion that the eel-tail bait was the most killing spinning bait for salmon, but we live and learn, and a year or two ago I was fortunate enough to meet a great professor of the art of salmon-spinning with the natural minnow, who made me a convert to his views in favour of the natural minnow when spinning for salmon, so far as regards rivers. By this gentleman, Mr. Augustus Grimble, I was also shown how to use and bait the tackle, of which engravings, of the actual size, are attached.

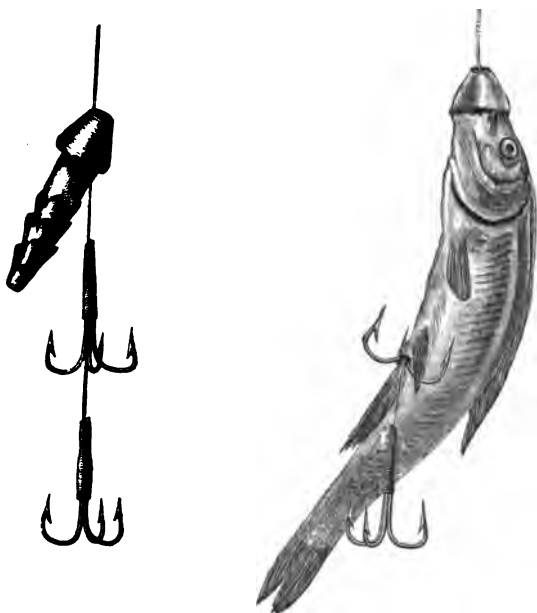


FIG. 1, 2.—SALMON MINNOW-SPINNING TACKLE.

Fig. 1 is the flight of hooks, with a leaden sinker run on to the trace, but, of course, in baiting the minnow this has in the

first instance to be slipped off altogether. The mode of baiting is as follows :

Having attached a baiting needle to the loop of the strand of salmon gut on which the flight is tied, pass it in at the vent of the bait and out at its mouth. The baiting needle is now taken off, the leaden cap slipped over the gut into the position indicated in fig. 1, and pushed down the bait's throat until it occupies the position shown in fig. 2, the whole bait being then pressed, or pushed, downwards on to the triangle, sufficiently to curve it, by a bending of the back, in the manner represented in the diagram. The 'nicks' or slices on the bottom part of the lead are made with a penknife for the purposes of keeping the lead in its place in the bait's throat and belly, but some spinners prefer it smooth.

The trace consists of two or three yards of picked salmon gut, with a good sprinkling of swivels at convenient intervals—N.B. double swivels best—and attached to a light well-dressed silk plaited running line, such as would be used in fine spinning for pike. When using the above tackle for spinning in lakes, &c., if the lead is insufficient, weight to any extent can be added by twisting lead wire round the reel line, two or three yards above the bait.

This tackle besides being excellent for spinning for salmon with the minnow in both river and lake is also one of the best I know for spinning that most deadly bait in Irish waters, the stone loach or colley, as it is locally termed. The loach, however, to spin well must not exceed three and a half inches in length as a *maximum*. Some further remarks as to the proportions to be observed between the length of the bait and that of the lead will be found farther on under the heading of 'Lake Spinning for Trout.'

The rod cannot be better than that described for worm fishing for salmon.

The best times of year for using this minnow-spinning bait are the spring and late autumn months. For some reason hot weather appears to be destructive of its killing properties, and

as a rule it is of very little use, or of none at all, during summer.

The minnow may be used successfully in almost any state of water which is not too thick and not too rapid. A moderately full water is, however, the best ; what would be considered good water, in short, for the fly—i.e. porter coloured. The rapidity of the current in the stream or pool should be such as to be sufficient to spin the minnow without, as it were, *tearing at it*.

The importance of this point will be understood when it is explained that it is upon the current of the stream itself that the minnow spinner practically depends entirely for the 'working' of the bait. He throws the bait down and across, and lets it *swing* with the current. He does not draw it in with his hand until the moment of taking it out of the water, for the simple reason that if found salmon will not run at a bait when it is being drawn in. In order, however, to increase its lifelike appearance, the spinner should continue, as the bait moves with the current, drawing the line in a little and then letting it go back—making a sort of see-saw, that is—with his left hand, although not actually shortening the line. Some spinners make this movement with the point of their rod.

It will be seen from the engraving that the minnows to be used should be large ones, and the fresher the better ; in fact, I should advise their being carried in a small bait can by the side of the river—Field's aerating bait can being very much the best for the purpose. Of course, if there is a sufficient supply they may be killed before starting and kept fresh for the day's work in a pocket-handkerchief frequently wetted, but they are apt, after a certain number of hours in this condition of dampitude, to get flabby, and certainly lose a part of their brightness and silveryness. A little oatmeal, put every morning into the bait can or tank in which the minnows are kept, will help to make them plump and in good condition.

For this sort of minnow spinning the artificial minnow

appears to be practically useless ; at any rate, the natural bait will kill ten or even twenty to one so taken.

The extremely local character of the minnow as a spinning bait has been already alluded to at the beginning of this article.

WORM FISHING FOR SALMON AND BULL TROUT.

There are many rivers in which the bull trout absolutely refuses to rise to the fly, and some in which salmon are so rarely to be tempted as to amount almost to the same thing so far as the angler is concerned. There are also frequently states of water—sometimes when it is too low and bright, constantly where it is too thick—in which fly fishing is so hopeless that some other mode of fishing must be had recourse to or the riverside abandoned.

Under such circumstances the worm is a perfectly legitimate bait, and used as I am about to explain must be admitted to afford quite as much sport, so far as the playing and landing of the fish is concerned, as fly fishing itself.

In saying that the worm may sometimes be used with success in water that is very low and bright, I refer entirely to this method of fishing, with which as I have myself repeatedly had good sport under such circumstances, I am confident that both salmon and bull trout may, at any rate in some rivers, be taken when the water is at its lowest and the sun at its highest and brightest. I will not say that this is always the case, but I have known it not infrequently to be so, and where fly fishing is out of question there cannot be any harm in at least trying the worm. The best water for worm fishing is whilst it is rising just before a flood, or clearing and settling down after it.

Many fishermen assert that fish will not take on a rising water, but in the case of worm fishing for salmon and bull trout I have repeatedly proved the opposite of this to be the case. Indeed, I hardly know which state of the water is the more favourable. Perhaps the first symptom of a freshet, bringing

down with it, as, of course, it does, a certain amount of bottom food, puts the fish at once on the alert and on the look-out for 'ground bait.' There is a pool on the upper Usk, locally called the Bason Pool, with a stone in the middle which acts as a sort of water-gauge, and when this stone was nearly, but not quite, covered, worm fishing in the pool was at its perfection, no matter whether the level were reached by the rising or falling process. When once the water was over the stone it would be a saving of patience and tackle to sit down on the bank and smoke, for the chance of killing a fish was almost *nil*.

Everyone knows, of course, that the rule of a certain level of water being requisite holds good with regard to fishing with the fly in almost every pool. I well remember that my friend, Mr. John Blackwall, junior, quite the most successful salmon fisher on the Conway, used to have such a water-gauge on the side of the river opposite his drawing-room window, some quarter of a mile off, but which he could yet command by the aid of a strong telescope or a pair of field-glasses, and he never used to think of sallying forth until the water had reached the exact mark.

This is all very well, however, for salmon fishers residing constantly within sight of their river, to whom time is of no particular object, and every month of the season open. For my own part, it takes a very bad state of water indeed to keep me from the riverside, and I must say that I can recall not one, but many occasions, when I have put my rod together amongst the scarcely suppressed jeers of my friends, and in the teeth of local *quidnuncs*, with the result of killing a salmon after all. I remember once, in particular, on the Bush, in the long pool below Bush mills, when the water was almost chocolate colour, and very nearly opaque, so that even my friend, Dr. Peard, one of the most expert and indefatigable of salmon fishers, as well as the most charming of companions, thought it hopeless to cast a fly—and he knew the Bush from the sea to the Leap, every stone and turn of it. And yet I had not been fishing ten minutes with one of Willie Haughie's

silver-bodied 'Bush-rangers,' as we used to call them, before I was fast in a good fish.

On another occasion, when the water was in a somewhat similar condition, and, I am sorry to say, my legitimate efforts were not crowned with success, I killed a salmon above the mills, in the pool rejoicing in the somewhat profane appellation of 'Jeannie's dam.' At this point, when a broad sweeping flood showed the river to be anything but dammed,

I sat me down to watch the waters flowing,

and forget the sensation of defeat in a cigar. Whilst thus occupied I noticed a large fish constantly rising in the same spot, about fifteen or twenty yards from the bank—indeed, rising with such persistency as to suggest an idea that I hastened to put into practice, but on account of which, I need hardly say, I have ever since suffered the pangs of remorse! Judging the distance of the rising fish as nearly as I could by the eye, I kept making casts as close over him as possible. Presently, as I had anticipated, the fish and my fly arrived at the same point on the surface at the same moment, when, as Artemus Ward would have said, 'by a dexterous movement of the body he managed to bring his off pectoral fin into vigorous contact with the barb of my fly-hook.' The contest was sharp, but not short. My friend, a fish with the tide lice still on him, and who eventually turned the scale at 15 lbs., showing the most furious indignation at the ungentlemanly treatment he had received,—rushing hither and thither, up and down stream, back and across, over and under, in a way that was a 'caution.' He gave me one of the warmest twenty minutes' work that I ever remember.

But this is a digression—or rather a confession, which I make, perhaps, with a view to 'absolution.'

So shall my soul of conscience-prick have ease. . . .

To return to worm fishing.

The Leap on the Bush—so called, I should imagine, 'kinder ironical,' as no salmon that was ever hatched could leap over it—is considered the best place on the river for the worm, doubtless because the fish work their way up to this point with the rising water, and there find themselves barred in the 'pool,' where if you fish sufficiently long and persistently you are pretty sure to be able sooner or later to show them the worm, or, perhaps, more correctly speaking, to bring it into juxtaposition with their noses.

The method of using the worm on the Bush, which is also that most commonly practised everywhere, is of a very primitive nature. A single large hook, say grilse size, is whipped on to two or three yards of salmon gut, and passed through the middle inch or so of three or four lob, and some smaller worms (according to the 'size' of the water and size of worms), which are run up the line one by one as they are threaded on, the last small worm being adjusted to cover the point of the hook. The worms are now slipped down the gut again, the lowest ones over the hook shank. A large shot, or small bullet, according to circumstances, is then attached to the line about $1\frac{3}{4}$ feet above the hook. The shot or weight should be sufficient to carry the line well to the bottom, but yet should not be so heavy as to prevent the stream 'dribbling' the bait along with it over the stones and gravel. The method of working this sort of worm bait is exceedingly simple. The fisherman, having chosen a pool where he is certain that there will be a good collection of salmon, goes on fishing it steadily out, throwing the bait up stream and letting it be brought down to him and carried past him by the current. The length of line to be used must, of course, depend entirely upon the size of the pool.

The first symptom of a bite is the bait ceasing to travel, followed commonly by a very gentle sort of twitching. Sometimes, however, as I have pointed out in the 'Modern Practical Angler,' although, in my experience, not very often, 'the salmon takes the bait in a more reckless fashion, resembling

rather the run of a trout. Having taken it, he will frequently remain nearly or quite motionless for some little time, and then move quietly away.' This is the moment to strike, with a quick, tightening pull, and as the bait is almost always actually swallowed or pouched, there is little fear of the fish being missed. Should he move away at once after biting, line must be given him and time allowed to pouch the bait.

To provide against sudden moves or rushes on the part of the fish, and unintentional checks on that of the fisherman, it is a wise precaution always to keep a yard or two of spare line loose 'in hand.' A jack rod and a spinning line, or a salmon rod with a short stiff top, will answer every purpose for this sort of worm tackle. It is, however, at best a clumsy and rather uninviting mode of fishing, both from the number of worms with which it is necessary to bait, and also from the fact of the hook being in most cases 'gorged' before the fish is struck. This deprives the whole business, in my opinion, of much of its interest as a sport, as when a fish cannot by any reasonable probability escape, the skill and excitement of landing him are reduced to a minimum.

There is, however, another method of worm fishing with which I have had splendid sport, both with salmon and bull trout, when fly fishing was, from one or other of the reasons already stated, utterly hopeless. And I may here remark, parenthetically, that such are the conditions to which I should be disposed myself to limit the use of the worm as a bait for these fish, or, at any rate, for the former.

This method, which, until I adopted it, and published the successful results of my fishing with it, was unpractised, so far as I am aware, and at any rate 'unpreached,' by masters of the craft is, in my judgment, as superior to the system above described, both in its practice and results, as spinning is in advance of gorge baiting. The principle of this mode of fishing is, in fact, almost identical with that employed in ordinary brown-trout fishing with my two-hook worm tackle, the difference being the size of the hooks and the substitution

of a single lob-worm—large or small, according to the state of the water—for a single brandling ; in other words, the difference is merely one of size and proportion. The hooks, which it is very important should be stout in the wire—I may say, extra stout in the wire—should be two or three sizes larger than those in the trout tackle. No. 6 of my patterns is the best size when the water is low and clear, and with thicker water and an extra large lob-worm, No. 7 may be substituted.

I strongly recommend for this particular branch of fishing the bend of hook, figured at page 19. In the river where my method of worm fishing, as above described, was first practised, almost every other pattern of hook has been tried, but with markedly inferior results ; in fact, very few hooks of the size indicated are strong enough to hold a heavy fish, and I should therefore advise anyone intending to give the system a trial to take care that he gets hooks of the bend indicated, and by the best makers, otherwise they will infallibly give way.

Much finer tackle, especially in clear water, is here necessary than can be employed with the common style of worm fishing already described. In fine water I seldom use for the bottom links— $2\frac{1}{2}$ feet or so—stouter gut than such as is suitable, under ordinary circumstances, for white-trout fishing with the fly. The upper part of the trace should consist of a couple of yards of carefully picked and tapered salmon gut.

A diagram of the hook-part of the tackle, showing the distance between the hooks, and the size of the latter, is appended.



HOOK WORM-TACKLE
FOR SALMON.

The next question is the sinker or lead, which should be heavy enough to carry the bait *lightly down to the bottom*, no

matter what the depth. This is a point of really critical importance. To show how important it is, I may mention that I have repeatedly fished behind local anglers who have been using the ordinary worm tackle of the Usk—that is, one or two worms leaded so as to sink a foot or two below the surface—and killed fish in pool after pool which they, with probably superior knowledge of the current-sets &c. had drawn blank.

The necessity of always 'touching ground' causes, in rocky rivers, a very considerable loss of leads, and in order to meet the contingency, and also to prevent the trace itself being broken every time the leads got hitched, I found the most convenient plan was to have a number of smoked paternoster leads of various sizes attached to horsehair loops, and to fill my pockets with these before starting. Where, however, the water is not very deep and strong, a better expedient, in various ways, is the use of lead wire, attached in the manner shown in the diagram, to the finest drawn gut, or to the weak, flattened-out, and otherwise wasted ends of gut-strands, or, finally, to horsehair. For some reason this lead wire, probably from its yielding and bendable nature, seems to catch much less often than the common bullet or than paternoster leads.

'LEAD-WIRE'
SINKER.



When the latter are used, especially if new and bright, it is most important to smoke them over the flame of brown paper, or, still better, varnish them with 'Brunswick black,' before starting for the river, as otherwise the glitter of the lead will too often effectually scare away the fish. The lead, of whatever sort it be, should be attached to the trace about a foot and a half, or a little more, above the hooks—above the second knot in the gut, in fact—and there should be an inch between the lead and trace. The object, of course, of attaching the leads by fine or defective gut, or horsehair, is that when a foul occurs, which it very frequently

does, the 'lead link' should break at a considerably less strain than the main line, thus preventing the latter being lost.

In baiting the tackle the lob-worm should be put on the hooks *quite straight*: the upper hook near the 'knot' in the worm—about three-quarters of an inch, that is, below the head; and the bottom hook one and a half inch lower down—the distance, in fact, between the upper and lower hooks.

The stroke, which ought not to be too hard for fear of breaking the hooks, should follow immediately on a bite, or more often on a suspicious stoppage of the bait in its passage over the bottom.

Although the stroke need be but a light one, it is very important that it should not be omitted, as it would appear from the number of fish I have hooked on the outside of the nose and mouth, and occasionally on the pectoral fin, that the salmon is frequently in the habit of pushing the bait about with his nose or smelling it without (or before) actually taking. This, of course, produces a stoppage in the line, and, in fact, all the effect, so far as sensation goes, of a bite, and a 'gentel stroak,' as Nobbes calls it, will hasten his decision in a direction favourable to the basket.

For this business a much lighter rod is required than for worm fishing with the bunch of lob-worms in the old fashion. With a heavy clumsy rod the delicacy of touch necessary in feeling the nature of the bite cannot be obtained; the rod which I use for the purpose is the same referred to in Vol. II. as a light spinning rod for jack, the butt and top being of solid wood and the middle joints of bamboo. The length of the rod should not exceed fourteen feet. It is, in fact, just such a rod as most fishermen would think perfection for pater-nostering or minnow spinning for ordinary lake trout (not *ferox*).

With such a weapon, however, specially made for myself to stand hard work, I have landed some hundreds of salmon and bull trout, and lost hundreds more (for with these fine hooks there are always more losses than kills), but it is still in good

working order. I say nothing of the fact that I have used it for spinning since the year —, but 'let us not particularise !' as the player says. . . . Anno Domini is merely an abstraction, a nightmare, and time only an excrescence on eternity. Notwithstanding which highly philosophical observation, it behoves us all to remember the *carpe diem*. . . . And yet I am wandering off from my text, and diverting from their proper channel moments which should have gone to a discussion of whether worm fishing for salmon is, or is not, sportsmanlike, and, if so, where and under what circumstances?

However, I think I have sufficiently indicated my ideas on the subject in the preceding pages, and the digression will at least save me entrance into a 'thorny' dispute. I can only say that with this tackle, fished in the way I have described, I have repeatedly taken salmon in a bright sun and in the clearest and finest water, and after all other methods of fishing—fly, minnow, and the old-fashioned bunch of worms—had failed. In fact, Stoddart considers that worm fishing of all kinds is at its best under such conditions ; but I cannot say that I agree with him there, a full or porter-coloured water being, in my experience, generally the best.

When water or weather is bright, it is, of course, of the utmost importance that the worm fisher should keep carefully out of sight, and as far as possible below the spot where his bait is fishing ; in other words, he must always cast up stream where feasible, letting the current bring the bait down towards him, and keeping as little slack line in the water as possible. This is a *sine quâ non* in my method of worm fishing. Great nicety in the manipulation of both line and bait, as well as fine hooks and tackle, are also required to insure success, and these considerations render it, I maintain, both a truly 'sporting' and sportsmanlike method of fishing.

Here is a record of the number of salmon and bull trout taken in this way between the 29th of September and 1st of November, 1879, by Mr. Edwin Darvall and myself during thirty-two consecutive days, less six not fishing : 3, 14, 1, 7, 9, 10, 5, 14, 6, 7, 4

15, 4, 6, 16, 10, 9, 4, 3, 5, 9, 5, 4, 11, 2, 13, 8, 17=221, with a total weight of 1,800 lbs. or an average of 69 lbs. per day. This list includes several fish weighing over 20 lbs. The six best days were 1st of October, 101 lbs. ; 3rd of October, 101½ lbs. ; 7th of October, 100½ lbs. ; 13th of October, 146 lbs. ; 28th of October, 150 lbs. ; and 1st of November (the last day of the season), 170 lbs.

THE PRAWN OR 'SHRIMP BAIT' FOR SALMON.

As my experience of fishing for salmon with the prawn is somewhat restricted, I have asked Major J. P. Traherne to give my readers the benefit of his more extensive knowledge of the subject, and he has obligingly furnished me with the following notes :

'Of all baits that are used for catching salmon, the prawn, or shrimp as it is sometimes called, is the most deadly. It doubtless forms a part of his natural food during his sea life, and his preference for it to any other bait that is offered him in fresh water is therefore easily accounted for.

'It is often assumed that a salmon will not take a prawn except when the water is low and clear. This is a mistake. The assumption has probably arisen owing to the majority of anglers never dreaming of using anything but the fly as long as the water remains in order, and it is not until the fly has ceased to kill and the water is dead low and clear that they think of resorting to any other method. Salmon will take the prawn in almost any height of water as long as it remains clear.

'In the season of 1884 I was fishing the Aberdeenshire Dee. It was in the latter end of the month of February, the water bank-high and rising from the melting of the snow. In one of the pools there was a great show of fresh-run fish, and after essaying all sorts and sizes of flies and bait without success, I tried the prawn. I had very soon a brace on the bank . . . but the fish in the pool were "travellers" and soon disappeared, or otherwise I might have caught more of them ; the same thing

happened on several subsequent occasions—as long as the water was clear. In the Dee it is seldom muddy except in a high flood, and it clears very quickly.

‘On the Shannon, at Castle Connell, and on the Galway river they seldom use any other bait but the prawn during the spring months, because it is found to be so deadly ; and when fish are what is called “sulky,” and refuse the fly, I think it perfectly fair to catch them with the prawn or any other bait they will take. I do not mean to say they will always take a prawn if judiciously offered them ; on the contrary, I have sometimes fished for a whole day with it without a touch ; but such occasions are very rare, and except when trailing the prawn behind a boat when fishing alongside of a fly and colley on the Shannon at Killaloe I cannot recollect a fish to have ever taken any other bait in preference, always assuming that the water was clear enough to use it.

‘It is quite possible that on the occasion I have mentioned the fish may have seen the fly or colley before they saw the prawn, and being in the humour they took the first of these that came across them. I am inclined to this belief, as I observed that my boatmen let out a much longer line for the prawn than they did for the fly and colley, and consequently the last had the better chance of being first. Prawn, as well as all other bait fishing, is looked upon with great disfavour by a good many fishermen, who call it “poaching” and an unsportsmanlike proceeding. They think it useless fishing a pool with the fly on the same day that it has been fished with a prawn ; and some even go as far as to say that it spoils the pool altogether for the season.

‘Of course a fish that has been caught with a prawn cannot be caught over again with the fly, but barring the pool being *minus* a fish or two, which it is quite possible might have been the case had it been fished with a fly, no harm whatever will have been done. Prawn fishing neither disturbs nor scares salmon ; and I know from my own experience that when the water is in order for fly fishing the chances of catching a fish

are as good as ever for the fly two or three hours after the prawn has been over a pool. Those who say that it spoils the fishing for the fly lose sight again of the fact that salmon stay but a short time in any one part of a river, and that the fish that have been fished over in one pool by one man with the prawn, or any other bait, may, by the time the next man comes to the water, have left that pool, whilst their place has been occupied by a fresh run of fish.

‘ Prawn fishing is a very pleasant *dernier ressort*. One never need despair of bringing home a fish, and salmon will take it in the lowest water and on the brightest and hottest days.

‘ Prawns for use in the coming season should be got in during the previous autumn, when they can be bought cheaper than at any other time of the year. The fresher they are when used, the better ; but if they are properly preserved they will keep their colour very fairly and take almost as well six months afterwards. They should be selected of different sizes, to be used according to the state of the water. Those with spawn in them are said to be the most killing.

‘ The following is one of the commonest methods for preserving prawns : Put the prawns in a saucepan of water with a handful of saltpetre, and boil them ; taking them out the moment they turn colour. Then spread them on a cloth singly ; and when they are *quite* dry, place them in layers in a wide-mouthed glass or earthenware jar—as many as it will hold. Fill up to the bung with glycerine ; cork the bottle and fasten the cork down, if possible, with bladder covering, so as to exclude the air.

‘ Another, and perhaps a better way, is to preserve in salt. Fill an earthenware jar with prawns nearly to the top ; heap on common salt, pouring water enough on it to dissolve it so as to fill up the interstices ; continue until the jar is full, and secure with a cork as before. Prawns preserved in salt last much longer, and keep their colour better than when kept in glycerine. They are also much tougher, which is a great advantage.

‘ I have seen prawns in their natural state that have been

preserved in salt used with great success, and indeed it is difficult to see why it is thought necessary to boil them. The boiling process doubtless gives them a very attractive appearance, but a salmon in a predatory humour is no respecter of colour. It is the smell that is the attraction ; otherwise how could fish feed on worms, and other natural food, in thick water in a heavy flood, when it is impossible for them to see an inch before them ? That fish possess considerable powers of smell is well known, and is proved if only by the fact that salmon roe will attract trout to it from an almost incredible distance down stream, in flooded water. I have never heard of an instance of a salmon being caught by an artificial prawn when fished like the real bait.

‘There are many different sorts of tackle used for fishing with the prawn. I have tried most of them, and as I think that nothing can beat one that was shown to me by Mr. Barter, a well-known and most successful salmon fisher in the South of Ireland, I append a drawing of it. This gentleman has made prawn, as well as every other mode of bait fishing, his especial study, and I know no better authority on such matters.

‘Fig. 1 represents the tackle before the prawn is put on. The point of the needle is to be inserted in the tail and brought out at the middle of the breast, the point protruding about one-eighth of an inch ; the small loop underneath the shank of the lowermost double hooks is then drawn over the point and pulled up as far as it will go, and the tail made fast to the trace by binding it with one or two turns of red cotton thread.

‘If it is thought necessary, in order to prevent the action of the stream from tearing off the scales, the binding can be continued four or five turns towards the head and back again to the tail and there fastened off. If this is carefully and artistically done, a prawn should last a long time even in a rapid stream. When preserved any length of time in glycerine it will generally require binding, but if it has been kept in salt

the fastening at the tail, with perhaps one or two turns to secure the double hook under the head, will be sufficient.

‘When completed and ready for use, the bait should be as represented in fig. 2.



FIG. 1.—PRAWN TACKLE.



FIG. 2.—PRAWN TACKLE BAITED.

‘Needles and traces with the double hooks—for which I find Mr. Pennell’s pattern very suitable—at different distances apart, and of different sizes suited to different sized baits—should be dressed beforehand ready for use. In high water the largest sized prawns may be used, but in the clear water

the smaller the prawn and the finer the tackle the better the chance of success.¹

‘The most suitable rod for prawn fishing is a light cane trolling rod about 14 feet long, or a grilse rod with a short top and upright rings. I prefer the latter, as there is a certain amount of spring in it and it is pleasanter to fish with. Malloch’s new patent trolling reel is admirably adapted to this style of bait fishing, as with it you can pitch your prawn out with a very slight amount of lead on the line. This cannot be done with the Nottingham reel, which requires a line to be heavily weighted.

‘The line should be a *very fine dressed one*, not thicker than a fine trout line. A stouter line would be useless, as it would not pay out through the rings. The line should be constantly tested, as it soon wears out from friction, &c. The rotary motion given to the line when paid off the drum of a Malloch’s reel is apt to make the line kink ; to avoid this a small swivel should be attached to it about a foot above where it is fastened to the trace—an ordinary single-gut casting-line, fine or stout according to the state of the water, with a swivel in the middle, and weighted according to the rapidity and depth of the stream. The heavier the weight the farther of course the bait can be thrown. With only one shot you could not expect to cast far, but as the water must be very low when such a light weight is advisable, the distance required can generally be made up by wading.

‘A certain amount of experience is required to judge the proper quantity of lead to be used, and it should be borne in mind that the prawn should not be allowed to drag the bottom as in worm fishing. The line should be weighted so that the prawn should work about midway between the surface of the stream and the bottom.

‘There are several different methods of fishing with the

¹ Mr. W. Haynes, fishing-tackle maker, of 3 Patrick Street, Cork, has invented a needle with a slit in it that saves much time in putting on a prawn, and renders binding with silk unnecessary.—ED.

prawn. In big rivers, where wading is impossible, it must be done out of a boat either by casting or trailing. At Castle Connell on the Shannon they spin it ; at Galway, where during the spring months nothing else is used but the prawn from 9 A.M. to 6 P.M., they let it drag with a heavy weight on the bottom as they would do when worm fishing. At Killaloe on the Shannon I have caught several fish by working the prawn "sink-and-draw" fashion, as if I were fishing with a gorge hook for pike. There was, opposite the marble works, a large pool with a very strong backwater, which always held a number of salmon, and part of the programme when fishing the pool was to use the prawn in this backwater in the sink-and-draw fashion. I seldom tried it without catching a fish. This is the only place I ever saw it tried, but I have no doubt it would be equally successful elsewhere.

'The pleasantest way, however, to work the prawn is from the bank, or when wading, on a warm day when there are plenty of fish within easy reach. It is to me the most fascinating of all bait fishing, but it does not give me the same amount of pleasure or excitement that fly fishing does. The mode of proceeding is as follows : Reel up your line to within about six feet of the top of your rod ; swing (*not cast*) it out at an angle of about 45° down stream, and let the prawn come slowly round to the side you are fishing from, keeping your rod in the same position. If the stream is rapid let out a yard or two of line by degrees as the bait works round, which will prevent the action of the stream stripping off the scales of the prawn ; and for the same reason wind up slowly before making a fresh cast. When the stream is very slack it will, on the contrary, be as well to gradually wind in a few yards of line to prevent the prawn catching on the bottom.¹

¹ A recent writer, under the signature of 'Sentry,' in an angling journal, who says he has used the shrimp or rather prawn bait with great success for many years, recommends that 'If used in slow-running water, it should be tied on the hook so as to "spin," the point of the hook being inserted through the head, brought out near the tail, and tied at each end with a little red thread or silk ; in that way it can be used trolling in both slow and running water. It

'On a fish taking the prawn, you will, if inexperienced, at first fancy yourself fast in a rock ; but you will soon learn to distinguish in a moment—by a sort of indescribable sensation—when your line tightens in a fish. When you first feel him do not strike, but give a good 'pull' or two. After two or three seconds have elapsed many fishermen strike or jerk up the point of their rod, but I am against this plan of hooking a fish for reasons I have already explained in my notes on fly fishing.'

Quitting now the subject of prawn or 'shrimp-bait fishing' for salmon, with thanks to Major Traherne for his excellent hints, and wishing him 'a light heart and a heavy creel,' we must step into the boat that has been awaiting us for the last half-hour, and putting ourselves under 'the creature Dougal's' guidance make play for the upper end of the loch—'Youth on the prow and pleasure at the helm'—so as to have at least a couple of hours before sunset to try our luck at

SPINNING FOR LAKE TROUT.

Putting aside the true salmon, *Salmo salar*, which has been already alluded to, there are three species of *Salmonidae* taken more or less constantly with the spinning bait, namely, the common trout, *Salmo fario*, the Great Lake trout, or grey trout of the Cumberland lakes, *Salmo ferox*, and the sea trout, or salmon trout, *Salmo trutta*. This sequence represents probably the relative importance of the three fish from the point of view of the lake spinner. Indeed, as the sea trout is most commonly taken when spinning for one or other of the

can also be used in the latter put on the hook the reverse way, and used casting, with a little lead about eight inches from the bait, and again eighteen inches higher up on the casting line, according to the depth and strength of the current. In casting, the bait should be thrown directly opposite the angler and allowed to swing round, care being taken not to allow the line to be ahead of the bait. In trolling with shrimp, always place the lead about two feet from the bait, and use single gut. Fish will take a fresh shrimp much better than a stale one.'

first-named fish, and the tackle &c. used are the same as those applicable to spinning for brown trout, I think probably no further details in regard to that fish would be of any practical use. It may be mentioned, however, that when neither casting with the artificial fly nor spinning, whether trailing or casting, has appeared to be of any use, I have not unfrequently found sea trout inclined to take the artificial fly if trailed forty or fifty yards behind the boat. I have had some very good sport in this way on several Scotch lochs, on Loch Maree, for example, and I have before me now the two flies which I found most successful. One is a grilse fly, dressed on a No. 1 Limerick hook, orange floss silk body, ribbed with a claret or fiery brown hackle, tag blue silk and silver twist, tail strands of tippet and blue macaw, mixed wing, and jay hackle, head, ostrich herl. The other was a somewhat larger fly with a body of claret-coloured mohair ribbed with silver tinsel, tag orange silk and silver tinsel, tail a topping, brown mallard wings and a whity brown hackle. The prevailing tone of the first fly may be described as orange and blue, and that of the second as claret and whity brown. I have had very good sport with these same flies in other waters. It may be added that the sea trout is more often to be tempted by an artificial bait than either the brown or lake trout.

The name Loch Maree recalls a disgraceful practical joke whereof I was the principal instigator, and in which, I blush to say, a most charming young lady—and a capital ‘fisherwoman’ too—was one of the victims. . . . If these lines should by chance ever meet her eye I hope she will not be very implacable! *Tempus edax rerum.*

The neighbourhood of broken rocky islands, and round and amongst submerged rocks, is generally good holding ground for both sea and brown trout, and such a place, in the absence of local guidance, I should select for my ‘trial spin’ over new water.

It is seldom worth while to attempt lake spinning for brown trout unless they run large, say over a pound at any rate, as otherwise more sport and better will be obtained by fly fishing.

Moreover, spinning for brown trout in lakes is rarely, in my experience, very deadly, unless in waters of considerable size, and in rough windy weather. There are, however, exceptions to this rule, and I have more than once made a good basket of brown trout when the sun was at its brightest, and the surface of the lake like a mill pond.

In judging of the ground over which it is best to spin, the following hints, in addition to those above given, may be of use.

There is round the shores of almost all lakes a point on the shelving bank under the water line at which light and dark seem to meet ; in other words, where the rocky or gravelly bottom becomes quite invisible, owing to the depth of water. Just about this line, and rather a yard or two outside than inside of it, is usually the best for spinning. The food of both the Great Lake and brown trout consists, to a great extent, of small fry. These usually, in nautical phraseology, more or less 'hug the shore,' up which, therefore, stopping short at the shallows, the trout naturally comes in pursuit of them. This question of locality is, as I pointed out in the 'Modern Practical Angler,' rather an important one, as thereupon it depends mainly whether the bait is ever in a position to be seen by the fish it is intended to catch. The observation has special reference also to the Great Lake trout, in regard to which I have offered the following observations in the passage already referred to.

The secret of success in spinning for the Great Lake trout lies principally in four points—time, depth, speed, and place, thus :

Time.—As a rule, *begin* fishing when other people are *leaving off* ; that is, in summer at about six o'clock P.M. From this hour until midnight lake trout may be caught.

Depth.—Instead of weighting the tackle to spin the bait at some three feet from the *surface*, lead it so as to sink to within about the same distance from the *bottom*, be the depth what it may. Both for this purpose, and in order to keep the bait at a distance from the boat, it is almost indispensable that from

forty to fifty, or, in very deep water, as much as sixty and even sometimes seventy yards of line, should be let out from the reel.

Speed.—Let the boat be rowed *slowly*, rather than at a brisk, lively pace. A large lake trout will seldom trouble himself to follow a bait that is moving fast away from him; consequently the bait must possess the speciality of spinning, at all events moderately well, or it will not spin at all.

As regards the tackle for lake-trout spinning, the rod, reel, and reel line recommended (p. 359) for worm fishing for salmon in rivers will answer admirably. If the bait be a minnow, the flight also (here repeated in cut) described for



MINNOW BAITED.

spinning it will answer remarkably well in lakes, as also for spinning a loach, or colley, as it is called in Ireland. The latter makes one of the very best lake trolling baits, up to a *maximum* of $3\frac{1}{2}$ inches in length, tail fin included. Beyond that length this tackle will not spin the loach, or any other bait, properly, but produces an eccentric sort of 'wobble' rather than a spin. From $2\frac{3}{4}$ to $3\frac{1}{4}$ inches is the best length; or somewhat less in the case of the female fish, which about May become quite distended with ova. For one of these plump little ladies in roe $3\frac{1}{4}$ inches is the outside length, and $2\frac{3}{4}$ inches is better—a quarter of an inch makes all the difference. The 'slenderer' the loach the better it spins.

In choosing leads for baiting with the loach the thinnest should have the preference, as the little fish has not a very capacious 'gape,' and if the leads are too thick they are apt to split the jaws. The length of the lead will also vary slightly as the bait is longer or shorter ; one inch, 'cap' included, would be about correct for a loach of 3 inches. For a long slender bait of $3\frac{1}{2}$ inches, a slightly longer lead—say $1\frac{1}{8}$ in.—is desirable.

Small baits are greatly preferable to large ones in lake-trout spinning ; indeed, I think the bait can hardly be too small if it spins really well.

When the flight above recommended cannot be used, either owing to the baits being too large, or for other reason, the first of the sizes of flights described for pike fishing in the second volume, but dressed a good deal smaller, will answer well. This flight consists of tail and reverse hook (in one piece), body hook, one flying triangle, and a lip hook. The flying triangle, however, should be adjusted so as to hang nearer the bait's tail than for pike fishing, as pike take usually across the head and shoulders, and trout very often, especially when not very keenly on the feed, almost (or quite) by the tail.



LEAD AND LOOP-SWIVEL (DOUBLE) FOR HEAVY LAKE TROLLING.

The mode of constructing the trace for this latter tackle is also very similar, substituting, however, gut for gimp—three or four yards of it—and putting the lead a couple of yards away from the bait. The size of the lead must of course vary according to circumstances. The lead shown in the diagram annexed is the best I know of so far as shape is concerned, and where a fixed lead is employed—a lead, that is, permanently attached to the trace. Combined with the double swivel figured, it will entirely obviate the spinner's *bête noire*, 'kinking.'

It not unfrequently occurs, however, in trolling for lake trout, that extreme fineness of tackle is of such paramount importance that all fixed lead on the line or trace has to be dispensed with, and concealed instead in the belly of the bait itself, as in the tackle above figured. In this case the spinner must take his chance of 'kinking;' but as the bait never need be 'cast' in trailing, the line being merely paid out from the reel by degrees, without any loose coils lying about, kinking is not of such very vital consequence—not, at any rate, of such disabling consequence—as where the bait is constantly being cast and drawn in by hand. When no fixed leads above the bait are used there should be at least two double swivels, the first two or three feet above the hooks, and the second about the same distance above that again. When an extra 'sinker' is required, an excellent 'removable' weight is formed by coiling *lead wire* on the reel line, three or four yards above the bait. This can, of course, be taken off, as well as diminished or added to, at pleasure.

With regard to the ordinary brown lake trout (*fario*), though they may not unfrequently be taken at night when trolling for *ferox*, they are rather day than night feeders, and usually take best before noon.

The tackle and bait for Great Lake trout spinning are similar in all respects to those above recommended in spinning for ordinary lake trout, except that it may be advisable, where the former run large, to add a few inches of gimp next the bait, as the *ferox* is appropriately so called, and bites like a bull-dog.

The loach, as I have observed, is one of the very best spinning baits for all sorts of lake trolling. The way to catch him is to walk up the middle of a shallow pool or stream where he abides, carrying in your right hand a three-pronged dinner-fork. Armed with this you turn over with your left hand any flat tempting-looking stones under which the loach, or 'beardie,' as he is sometimes called, usually has his *habitat*; his nose or tail will very likely be seen projecting. It then

becomes a comparatively easy matter with a quick eye and a steady stroke to transfix him with the trident and transfer him to the bait basket. The loach has the very ostrich-like habit of conceiving its body to be hidden whenever its head is, and thus facilitates materially the operations for its capture.

In all lake spinning the best plan, nineteen times out of twenty, is to trail the bait behind the boat, and the farther off, within reason, the better—the distance being to a great degree regulated by the depth of the water. The weight of the lead also must be correspondingly increased or diminished, and should be used either fixed or 'removable' as already indicated. When you have a 'run' the fish ought to be at once sharply struck, and the boat stopped.



'CLEOPATRA BAIT.'

In artificial baits of all sorts I have not a very robust belief. As, however, natural baits cannot always be obtained, and as, indeed, it would appear from the *Sporting Press*, that other fishermen's experience on the subject differs from mine, I may mention one or two kinds of artificial baits which seem to possess special recommendations.

First, there is the time-honoured 'phantom minnow,' both blue and brown, which has many admirers, and after that follows an army of less known nondescripts of all kinds, 'Archimediands,' 'water witches,' 'mermaids,' and what not. All or any of these may or may not be good; unfortunately the life of any one fisherman is too short to give them all a fair

trial, and in selecting his artificial baits, every spinner will, perhaps, be wise to follow his own particular fancies. Amongst recent patents and inventions, however, which the Fisheries Exhibition brought into notice, may be mentioned Hardy Brothers' 'Halcyon spinner,' and Watson and Sons' 'Cleopatra' bait, with pliable joints of polished metal (figured in the diagram), Mr. Jas. Ogden's 'Premier spinner,' and Messrs. Cummings' (of Bishop Auckland) 'Quill minnow.' Diagrams of the two last-named minnows of the smallest sizes will be found figured under the head of 'Stream Minnow-Spinning for Trout.'

There is no difference in the *modus operandi* as regards artificial baits, it is merely necessary to substitute them for the natural bait and flight, leaving the spinning trace in all respects as already described.

STREAM MINNOW-SPINNING FOR BROWN TROUT.

This is the only sort of fishing that I am aware of in which an artificial bait may really be used with satisfaction and success, and it is probable that, as a matter of fact, many more trout are actually killed in the streams with the brass minnow, or some other artificial imitation of the real fish, than with the minnow itself. But despite the dictum of Mr. Hewitt Wheatley, whose 'nymphs' and 'water witches' were, I must say, most graceful, and beautifully drawn, I am disposed to think that this artificial inequilibrium results rather from the additional trouble involved in obtaining and baiting the natural minnow than from any intrinsic advantage which the artificial imitation possesses. Be this as it may, however, I shall begin with the natural bait, on the principle, if upon no other, that the original should take precedence of the copy.

The difficulty has always been to find a tackle which—whilst placing the lead in bait's belly, and at the same time obviating the necessity, common to most minnow tackles, of detaching the flight from the trace before baiting—will spin the

natural minnow to sufficient perfection, and at the same time possess the advantages in regard to hooking power presented by the arrangement of flying triangles usually attached to the artificial bait. I gave a great deal of trouble to the subject some years ago, and the outcome is shown in the diagrams, which represent the tackle I found to best fulfil the required conditions.

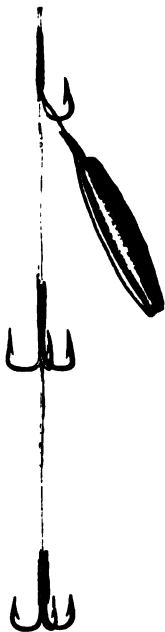


FIG. 1.



FIG. 2.

Fig. 1 represents the tackle by itself, and fig. 2 the same when baited with a minnow.

In order to bait it, all that is necessary is to push the lead down through the minnow's mouth into the belly, pass the lip hook through both lips of the bait to close its mouth, and then insert one hook of the first triangle just below the back

fin so as, by aid of the lead inside, to crook the body of the bait as shown in fig. 2.

This flight not only gives a very perfect spin to the minnow, when employed as in stream fishing—that is, with a short line, and ‘in-and-out’ casts—but it combines simplicity and ‘fineness’ with hooking power. The lead lying in the bait’s belly also puts the weight exactly in the place where it is most wanted and least seen. As there is no lead on the upper part of the trace to counteract the rotatory action of the bait and to oblige the swivels to act, so to speak, it will very often be found that after a good long ‘draw’ through the water the twist of the bait has more or less imparted itself to the line, and when this is the case a second or two should be allowed for the line to untwist before the next cast is made. This is, of course, equally the case in spinning with the artificial minnow. The tackle should be kept of two or three different sizes, to meet variations in the size of the minnows. Another, and perhaps at least equally good flight, is that already described (p. 371) for lake-trout spinning, substituting a smaller bait and a corresponding lead. Here, however, the hooks require to be detached from the trace before baiting.

One or other of these arrangements can be recommended as realising in different ways what are very likely the attainable ‘possibilities’ in the matter of Stream Minnow-Spinning tackle.

The trace should consist of two or three yards of fine picked trout gut, with at least one double swivel not less than two feet above the bait. As, however, in this case no lead is used on the line, I should recommend a second double swivel placed about three feet above the first. The smaller the swivels are the neater will be their appearance and the better they will act. Care should be taken in choosing them to see that all the parts work freely before being attached to the trace or taken to the riverside. When dry, and again before being used, it will be found to make all swivels work much better if they are previously lubricated with rangoon or some other light oil.

The rod already described for worm fishing for salmon, with

an extra longish top, or a rod of the same description but of a somewhat lighter build—always, of course, with stiff rings—and a *very fine* dressed silk running line, such as I have referred to in the preliminary chapter on tackle—will be found most convenient for this sort of fishing, which is applicable throughout the season to every description of running water containing trout; sharp streams, stickles, and rushes being the most favourable.

In regard to the rod, line, trace, &c., and method of 'working,' there is no difference between the natural and artificial baits.



HEXAGONAL
MINNOW.

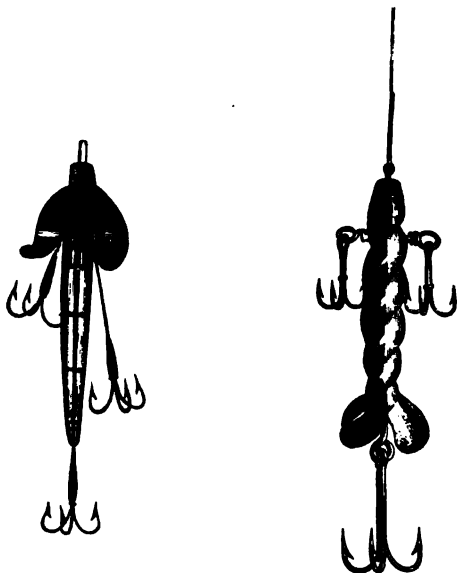
The engraving gives the form of an artificial minnow that I had made some years ago. I think it possesses in one or two points advantages over the plain brass minnow recommended by Mr. Wheatley, and notably in the position of the flying triangles, which it will be seen are so arranged as to make it almost impossible for a trout to escape being hooked. This minnow, which is made both of brass and white metal, is hexagonal or octagonal in form, the object being that the sides and angles catching the light may gain additional glitter and brilliancy. One side is coloured a bright metallic green to represent the minnow's back, the other half representing, of course, the belly. The small round protuberance above the lowest triangle, and at the base of the brass minnow, is a

glass bead which is slid down on to a knot in the gut, thickened at the point by waxed lapping so as to make it fit tight. The bead thus prevents the friction of the minnow fraying or wearing out the gut below.

The minnow itself can be so adjusted that the trace and tail hooks will either spin with it, or remain stationary and allow the minnow to spin by itself. Each alternative presents some

advantages, but in the former case the gut must be thickened by lapping where it passes through the minnow so as to fit close.

Another very pretty minnow, already referred to, the invention of Messrs. Cummings, of Bishop Auckland, is made entirely of quill (*vide* cut), thus presenting a more transparent effect in the water, and I have read accounts of remarkable success that has been obtained with it.



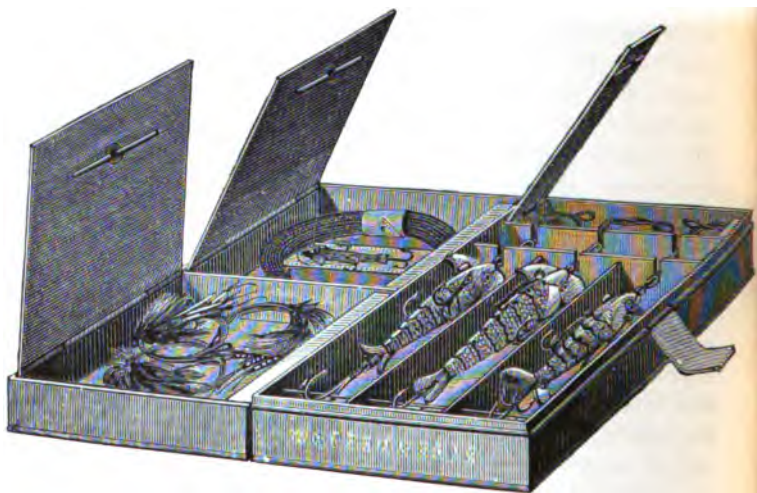
CUMMINGS' QUILL MINNOW.

OGDEN'S PREMIER SPINNER.

There is also Hardy's 'Halcyon spinner' which is said to have made a reputation on the Border streams ; and the 'Premier spinner,' the invention and patent of Mr. Jas. Ogden, of Cheltenham, which, judging by its 'rig' and spiral shape (*vide* cut), calculated to produce a glittering appearance in the water, ought to be exceedingly effective. Mr. Thomas Westwood, the well-known bibliophile, poet, and fisherman, writes to me in a letter : 'I tried the other day, with great success, a

minnow called the "Derby Trout Killer." It is sold by John Bullock, Compton Street, Derby. Ask for sizes No. 1 and No. 2. I bagged seventeen trout with it in a very short time, and a friend, who fished with me, twenty.'

An ingeniously constructed folding tray case has been lately manufactured by Messrs. Watson for the purpose of carrying these and similar baits (*vide cut*).



The minnow, both natural and artificial, can be used at all times of the season, and in all rivers where its employment is not interdicted. It is especially successful in some of the Devonshire and Cornwall streams for taking what is locally known as 'salmon peel'—a variety of migratory *Salmonidae* to which ichthyologists have not yet agreed in assigning a specific place. Some writers consider it as a sort of small-sized grilse, or the young of the true salmon on its first return from the sea, and others merely as a variety of the salmon trout. Unfortunately many of the streams of Devonshire and Cornwall have been so frightfully polluted of late years by mine water

that this beautiful and sporting fish is far from being as plentiful as it formerly was, and, indeed, from many rivers the brown trout also has well-nigh disappeared.

This is the more regrettable inasmuch as a little energy and enterprise on the part of the mine owners, especially owners of lead and copper mines—the great offenders—would almost, if not wholly, alleviate the mischief. In the case of the former a few catch pits into which the mine washings should pass and be allowed to filter before the water finally reaches the river, would render it perfectly innocuous, and I remember on one of the most beautiful rivers in Devonshire, the Teign, where this precaution has been taken, I have repeatedly caught some of the best trout of the day at the very mouth of the filtered outfall. The lead in this case, as everyone knows, is merely held ‘in suspension,’ to use the chemical expression, and, therefore, naturally sinks to the bottom by its own gravity, if the opportunity be offered.

With regard to copper mines the case is somewhat different, the copper being held ‘in solution,’ a far more intimate connection, and one which can only be separated by causing the copper to precipitate itself, as the term is. In order to effect this, however, all that is necessary is to place some old iron at the bottom of the catch pits ; the iron having an affinity for the copper, causes the latter to fall or precipitate, and it is quite a question in my mind whether the process referred to, both in this and the lead water, might not be carried out without any ultimate expense whatever by subsequent treatment of the precipitated and subsident metals. At any rate it is a subject demanding the urgent attention of the Legislature, if only viewed from the standpoint of the just rights of the riparian proprietors, to say nothing of the national importance of preserving our streams for the beautifying of the landscape and the enjoyment of the people. It is simply monstrous that mine owners for their individual gain should be allowed to destroy what the Scotch law calls the ‘amenities’ of all the people below them. Nor is it alone from the sporting or æsthetic

aspect of the case that this holds true. Streams polluted by mine water not only cease to contain fish and look disgusting, but are a positive source of danger to the health of the population who live upon the banks, and who, as well as the cattle, often partially poison themselves by drinking the tainted water.

WORM FISHING FOR BROWN TROUT.

Thanks to a great extent to the late Mr. Stewart, worm fishing for trout has been of late years rescued from a position of obscurity, not to say contempt, and elevated into one of the recognised branches of scientific angling. It was formerly supposed that worm fishing could only be practised with success in rivers or streams when in a state of partial flood. The fisherman, wielding a short stiff rod with a single large hook at the end of extra coarse tackle, used to walk down the river banks, when the water was supposed to be sufficiently discoloured, fishing before him or under him the likely looking holes, and hauling out, by sheer force and with the smallest possible amount of law, any unlucky victim which the purblind condition of its own element was mainly instrumental in transferring to ours. Thanks, I say, in a great measure, to Mr. Stewart and his teaching, all this is now changed, and, although with improved hooks and finer tackle, the worm-fisher will still expect under many circumstances to make a good basket in full or flood water, he regards as his red-letter days a scorching summer sun, and a water so bright and clear as to make fly fishing, except very early and late, next to an impossibility.

Making the best of these unpropitious circumstances, the sagacious angler leaves his fly rod at home, and betakes himself to worm fishing. Equipped with wading boots, or, better, wading trousers, he enters the stream, usually preferring a good broad sheet of water, not too deep, and, moving gently and cautiously, with a long, light, stiffish rod, he casts his bait well

up stream, letting the current, with an occasional assistance from hand and line, bring it down almost to his feet, or parallel with him to right or left, and if he gets a bite he strikes almost at once—or at any rate after three or four seconds—down stream, and retires with the descending fish until he has safely transferred it to his creel, usually without quitting the water. He then returns cautiously to his former standpoint and renews his attentions to the still unfrightened fish above—thus gradually ascending the stream step by step, and fishing every yard of water in front of him.

I would not be understood to advocate for a moment the use of the worm, even if practicable, in our highly stocked southern streams, nor would I personally exchange it for the fly whenever there is a reasonable chance of making a bag with the latter, but it frequently happens in such conditions of water and weather as I have described that this is in fact impossible, and there are hundreds of miles of wild river and stream scattered over Ireland and Scotland, and some of our Border counties, where worm fishing finds its legitimate scope and opportunity. And thus pursued I unhesitatingly assert that it is a branch of the sport which is in every way worthy of encouragement.

As the 'Fishing Gazette' has observed: 'There are more ways than one of fishing with the worm for trout, and it depends very much upon local circumstances whether the plan employed is fair or unfair. The man who by up-stream fishing on such waters as the Yore, the Coquet, the Eden, in June, July, and August, can in low clear water kill a basket of trout in the daytime is not less scientific or sportsmanlike than the fly fisher.'

As I have pointed out, an extreme refinement of tackle and niceness of manipulation is required of the successful practitioner in the modern school of worm-fishing. For short rods, coarse gut, and a single big hook must be substituted a long, light, and more or less pliant weapon, the very finest gut, and hooks but little larger than those on which the fly fisher dresses his gnats and midges.

Mr. Stewart was the first to advocate a radical reform in the matter of trout worm-tackle. His change was to substitute three or four small hooks for the one large one. This plan, by which the hooks were quickly and lightly passed transversely through the worm instead of being, as it were, threaded through it, has the additional merit of keeping the bait alive much longer, as well as of enabling the fish to be struck almost at the instant of biting, instead of being allowed some uncertain period in which to fairly 'mouth,' or, as it happens in many cases, 'pouch' the worm.

The drawback to this tackle of Mr. Stewart's was, however, in my opinion, the unnecessary multiplication of the hooks. These produced a certain amount of difficulty and delay both in baiting and subsequent disgorging from the fish's mouth. They also disfigured the worm, shortened its life, and whilst detracting somewhat from the natural appearance of the bait, were at the same time more conspicuous.¹

Indeed, as a matter of fact, I found it was by no means a very easy matter to insert the three, or, still worse, four hooks in their proper positions in the bait without breaking it.

In order therefore to meet these objections, whilst at the same time preserving the excellent principle involved in substituting several smaller hooks for one large one, I adopted, and some years ago brought to the notice of worm fishers, a two-hook tackle, which I believe will be found to embrace the meritorious part of Mr. Stewart's invention without its drawback. I may, perhaps, here quote from the arguments, *pro* and *con*, which I adduced at the time in support of these views.²

¹ *The Practical Angler*.

² On looking through the modern school of angling authors, I find the following recommendations and instructions on the subject of worm fishing for trout: Bowler, in his *Art of Angling*, recommends a single No. 5 or No. 6 hook; Mr. Stoddart advises, in his *Angler's Companion*, single hooks, sizes Nos. 10, 11, or 12, according to the dimensions of the stream, its condition, and the kind of trout inhabiting it; Mr. Bailey, in his *Angler's Instructor*, suggests a single No. 7; Otter's *Modern Angler*, a No. 5; 'Glenfin' (*The Fishing Rod, and how to use it*), a 6 or 7; 'Ephemera,' Hewett Whealey, and some other authors either simply recommend 'a single hook,' without

I give Mr. Stewart the greatest credit for the originality of this idea, which belongs to him alone ; at the same time, I am not surprised at its proving, as he himself admits, only a modified success. Mr. Stewart says that with this tackle he found he could kill larger fish, but fewer in number, than with the single hook, and that this experience was confirmed by others. He attributes, and I have no doubt correctly, the diminution in the numbers of fish run, primarily to the impossibility of properly concealing so large a number of hooks in a single worm, and to their being consequently seen by the fish. This was the principal drawback to the four-hook tackle. As a minor inconvenience, Mr. Stewart also mentions that, from the number of hooks often fixed in the fish's mouth when landed, a certain waste of time necessarily occurred.

These being the incidental disadvantages of Mr. Stewart's plan, its advantages were : (1) that the worm was more quickly baited than with the single hook ; (2) that it lived much longer—with the large single hook it dies almost directly ; (3) that it presented a much more natural appearance to the fish ; and (4) that, owing to the superior penetrating tendency of small over large hooks, much fewer fish escaped after being once hooked, whilst it became possible to use the finest gut, which could not be safely done with large heavy hooks. This is an advantage the importance of which can hardly be over-estimated in trout fishing in clear streams.

As regards the other point—the killing powers—my own experience of the tackle was that when fishing properly *up stream*, and with a shortish line, *hardly any fish escaped at all*, whilst with the large single hook, I think the experience of most of my brother anglers will bear me out when I say that fully fifty per cent. of runs were 'missed.' On the other hand, the practical force of the objections mentioned by Mr. Stewart to his own four-hook tackle could not but be recognised, and accordingly, after some experiments, I adopted a tackle consisting of only two hooks, and these a trifle larger and thicker in the wire, which, I found, whilst getting rid of the drawbacks, also combined one or two material improvements in other respects.

The great advantages, in several points, of the four-hook tackle

naming the size, or omit the question altogether. . . . It will thus be seen that a 'single hook' for trout worm-fishing has been hitherto universally recommended by angling authorities, with the solitary exception of Mr. Stewart, who boldly deviates from the beaten track, and gives a diagram of a tackle composed of four small hooks, in lieu of the conventional single large one.

over the large single hook have been already explained. The advantages which I believe will be found to belong to the two-hook over the four-hook tackle are: (1) It is baited in less than half the time; (2) the worm lives much longer; (3) its appearance is more natural; (4) the hooks are less conspicuous; (5) they are very quickly 'disgorged,' and (6) the tackle is more easily made.

In hooking and holding power I do not think that there is any appreciable difference. . . .

PENNELL'S 2-HOOK WORM TACKLE,



TACKLE UNBAITED.

TACKLE BAITED.

As regards sinkers, two or more good sized 'split' shot, according to the depth and rapidity of the stream, should be used about fourteen inches above the hooks. The shot should be sufficient to carry the bait close down to, or nearly dribbling over the bottom, without being heavy enough to make it check or stick fast. In shallow water only one shot, and that a very small one, say a No. 7, will be found necessary. Very fine

lead-wire is a capital substitute for shot, and is less liable to get irremediably 'stuck' in rock-crevices, &c. The difficulty is to twist it round the soft gut in a satisfactory manner. This difficulty, however, I overcome by laying a pin alongside of the gut and winding the lead-wire closely over both. The pin being withdrawn, the coils can be tightened very readily by simply twisting them round with the finger and thumb until they grip the gut. This method of weighting is less likely to result in damaging the gut than a split shot, which is nipped together and jammed on to it with the teeth.

In order to cast a light line of this sort, which, of course, cannot be done at all against the wind unless the line be cast as a fly-line, a 13 or 14 foot rod—or even longer—with small upright rings, and a fair amount of 'play' is desirable. The line should be of the very finest dressed silk, not thicker than stoutish sewing cotton. The length of cast that can be made depends, of course, very much upon the wind; under ordinary circumstances, however, unless heavy sinkers are used, the line that can be effectively worked will not much exceed the length of the rod, *plus* the gut cast of two or three yards.

The best worms for this sort of fishing for trout, and I might say, indeed, for every sort of fishing that I am acquainted with where small worms are used, is the brandling, or dunghill worm, which may be known by its yellowish stripes and the pungent odour it emits. This strong smell is, no doubt, one cause of its attractiveness as a bait. If brandlings cannot be obtained any worm which is of the right size will do—the redder the better. It is very important that the worms should be thoroughly scoured before being used, as it diminishes the chances of their breaking on the hook, as well as improves their appearance. The readiest means for scouring is in a large jar or box filled with damp moss turned every day or two.

The hooks figured in the illustration are of the correct size for a large brandling of the length shown. *When smaller worms are used the size of the hooks, and also the distance between them, should be reduced proportionately.*

To carry the baits for worm-fishing an open-mouthed bag, from three and a half to four inches square, and attached to a button of the coat or a button-hole by a loop of string, will be found much the most convenient method. Indeed, when constantly wading knee- or waist-deep in water, any other plan is almost impracticable—unless it be that of the small angler whose answer, when asked ‘What it was he was carrying in his mouth?’ has become proverbial.

In spite of the *medio tutissimus ibis* maxim, there is yet a certain drawback attached to this sort of mid-river work,—the drawback of losing time and disturbing the water by getting out on the bank for the purpose of landing the fish. On the other hand, the attempt to transport them direct from the water to the creel without a landing net is an almost hopeless, as well as patience-trying, undertaking. The worm-fisher must, therefore, practically as a matter of necessity, adopt a portable landing net, and that should be so arranged as to be instantly brought into play when required. To effect this some fishermen carry a very short net with a wooden hoop, and a handle about one and a half foot long which they pass under the creel-strap, or a small strap attached to the coat, under and behind the left arm, and thence into the pocket. The best form of hoop for this sort of pocket net is pear-shaped, about eight inches wide by eleven inches in length. Such a net ought not to exceed 3 or 4 oz. in weight, everything complete, and with it a fish of three pounds weight can be landed. The telescope net, however, described at p. 81, is in many respects a great improvement on this somewhat rough and ready appliance. All the other net-slings and similar contrivances that I have seen seem to possess the speciality of allowing the net to slip out of the socket when it is not desired, and to get stuck or hitched up in some way or other at the moment of requisition.

All nets should be made of dressed silk, so that they may not get sodden, rotten, or catch in the hooks or tackle.

‘CREEPER’ AND STONE-FLY FISHING AND
WASP-GRUBS.

Creeper or stone-fly fishing is a very local sport, and, indeed, so far as I am aware, is practised nowhere but on the Border and Lowland streams of Scotland.

Having said all I know on the subject of this fishing—and it is not much—in the ‘Modern Practical Angler’¹ I quote the following from its pages :

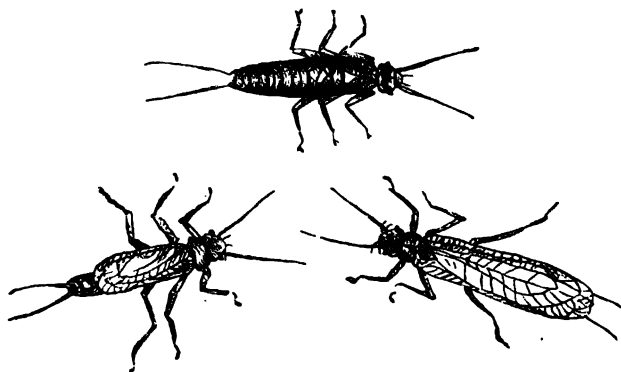
The creeper is the larva of the stone-fly (*Scottice*, May-fly), in which condition it passes most of the winter and spring months, living under stones in shallow water, from whence it may generally be readily obtained in quantities sufficient for angling purposes. It will live for days in any perforated can or bait-box, even if kept in the pocket, and for a longer time in a little water.

The rod, line, and hooks recommended for trout worm-fishing, and described under that heading, omitting the shot or sinkers, and setting the hooks a little closer together, will probably be found, on the whole, the best tackle for creeper-fishing. The mode of baiting and using the creeper is as follows : Put the upper hook through the shoulder, and the lower hook through the tail of the creeper, so that it may hang straight on the line : when baited, use it precisely in the same manner as the worm, always selecting rapid rather than still parts of the stream, and, of course, fishing up. The bright weather and low clear water, which are best for worm-fishing, will also be found most favourable for the creeper. The stone-fly usually remains in its larval or ‘creeper’ condition until the middle of May, and from early in April until this time heavy baskets may often be made of it. When in season, the creeper is commonly from an inch to an inch and a quarter long.

About the middle of May the creeper changes from the larval into the fly state, casting its tortoiseshell-like covering, and un-sheathing its wings, of which, however, it makes but little use. Mr. Stewart, whose excellent chapter on the subject should be studied by all Border anglers, considers that the fly is even more deadly than the creeper. He advocates the use of two flies as the bait. . .

¹ Fifth edition : George Routledge & Sons.

The fly is nearly of the same length as the creeper, and the tackle used for one may be used for the other. In fact, when creepers are changing the fisherman will often find it convenient to fish indiscriminately with either the one or the other. Trout take the stone-fly best *under* water, and *close to the edges* of the stream or pool. This point is laid much stress on by Border anglers, and with good reason, inasmuch as the natural spots to find the fly are close to the banks from which they are washed; and it is here consequently that the trout come to look for them. A dark, full water is more favourable for the effective use of the stone-fly than one that is low and clear; but in both states good baskets may be made with it. The flies should be collected in a box the night or early morning before they are to be used. The best places for finding them are under the stones above, but near



the water's edge; and where most cast-off shells are seen the fly will probably be found in the greatest abundance.

Colonel Campbell tells me that, on the Border streams, he has had great success with this fly used with blow-line tackle. A method of natural fly-fishing is also much practised on the Peterel, and doubtless on many other neighbouring streams, in which two flies—the specific names of which I could not ascertain—are used upon a small double hook.

The season for stone-fly fishing begins about the middle of May, and ends about the middle of June.

I have had some specimens of the creeper and stone-fly sent me by the obliging assistance of Messrs. Redpath, of Kelso, and the annexed sketch gives a diagram of the stone-fly in different stages of development. Messrs. Redpath have also made a special study of artificial imitations of this insect, both in its winged and larval condition, and have forwarded me samples, which I must say look exceedingly tempting and life-like.

Besides stone-fly fishing, the only really effective method of using the natural fly for trout that I am acquainted with is by means of the 'blow-line;' and the place to see blow-line fishing is in the lakes of Westmeath. Indeed, this beautiful chain of waters seems to be the natural *habitat* of the art. Each lake in its turn, as the fly appears on it, becomes for a few days a centre to the angling community, and many a boat which, as Pat says, is only safe provided you do not 'cough or snaze,' is then dragged from her moorings—perhaps at the bottom of the lake—and pressed into service. The art of blow-line fishing, though in its principle exceedingly simple, demands much nicety of execution in practice, and, as indeed its name implies, it cannot be pursued at all without the assistance of that most inconstant element, the wind. Weather, however, proving propitious, the tackle is easily adjusted. A skein of floss silk, prepared for the purpose, and attached to the end of a light running line, is substituted, so far as the actual casting is concerned, for the 'reel-line,' and to this, instead of the ordinary fly-collar, is fastened a single small hook whipped on a strand of fine gut. The hook is baited with a May-fly, and as the boat drifts the wind carries out the floss silk, which ought to be so managed by the aid of hand and rod that only the hook and fly should actually touch the water. Near the edges of the reeds will usually be found the greatest quantity of *Ephemeridæ*, and, as a corollary, the greatest number of trout.

The exact time for this fishing varies a little, as the spring has been cold or genial; and the several lakes vary also *inter se*, which is a great convenience to the fisherman; but from the middle to the end of May is commonly about the time. The Westmeath lakes, when the fly 'is up,' will well repay a visit, as the fish, which are at this time in the highest condition, running from two to five pounds, and sometimes nearly twice as much, take the natural fly freely; and if the angler puts Dr. Peard's charming little book,

'A Year of Liberty,' into his portmanteau, he will need no abler or more agreeable guide.

An analogous system to that above described is pursued occasionally on some streams in England ; but on others it is strictly prohibited, and on many hardly considered fair fishing. The circumstances of the two cases, however, are entirely different.

THE WASP-GRUB.

In some rivers, such as those of Shropshire and Herefordshire, the wasp-grub is occasionally a very killing bait for trout, although, curiously enough, grayling are but seldom taken with it, even in rivers where they most abound. The only difference as regards tackle, method of fishing, ground baiting, &c., between wasp-grub fishing for trout and gentle-fishing for grayling, as described further on, is in the size of hook, which should be about a No. 7 of my patterns. Two wasp-grubs may be used as the bait ; the first run right through from head to tail and drawn up the hook-shank, the second covering the point and bend of the hook.

Though an excellent bait for trout, and, indeed, said to take the finest fish and those in the best condition, the wasp-grub is an exceedingly delicate bait to manipulate. So delicate, indeed, as not to be fit for use in its natural state, and to require much care and attention in preparation.

The plan adopted by Mr. Jones, of Ludlow, an apostle of this kind of fishing, was as follows :

To a pot of boiling water add a little salt, and whilst it is boiling put the wasp-grubs into it for two or three minutes. Take the pot off, then pour the water and its contents through a sieve, and when the grubs have remained a minute or two to 'draw' put them on the hob on a duster, or on a piece of flannel, or cloth of some sort, for about half an hour. This draws out the moisture and makes the grub sufficiently tough to remain on the hook.

In selecting the baits for the hook choose the specimens which are the least wasp-like in appearance, and put the others aside to be used as ground-bait in the manner described with regard to gentle-fishing.

Here is a receipt for taking a wasp's nest : Cover your face and head with a veil over a fencing mask. Tie your trousers and coat-cuffs at the bottoms, put on a pair of stout gloves and proceed with a shovel to quietly dig out the nest. This is the way to get stung ; which I can answer for as I have tried it. If, however, you have any objection to the process, then you will find it the better course to preface the 'digging out' by first suffocating the wasps with a sulphur and gunpowder squib in the manner which will be found detailed in Vol. II.

THE GRAYLING, AND BAIT-FISHING FOR.

CONTINUING my observations on bait-fishing for *Salmonide*, I come next to Grayling—the remaining British representative of the family possessing any great interest for the sportsman, and, indeed, ranking ‘with but after’ its ‘star-stoled’ cousin of the brook, *Salmo fario*.

When grayling, or grayling fishing, is the subject of conversation among fishermen, almost the first thing one is sure to hear is a discussion of the relative merits of this fish, from an angler’s point of view, as compared with the trout; and a consensus of opinion is usually at last arrived at that the trout is in every way the more mettlesome and sporting fish, but that the grayling possesses one unique advantage over him, from a fly-fisher’s standpoint, in that he is in prime condition when the trout is out of season, and, of course, unfit to be taken. Trout, in fact, spawn during the late autumn and winter months, and grayling during April and the early part of May, when they come up the gravelly scours in shoals, in this respect resembling dace. The grayling has, moreover, the advantage of rarely being so much out of season as to be unfit for food, or unwilling to take a bait if judiciously offered. Sir Humphry Davy, who has given us a very fair history of the fish, considered that it might be fished for at all times of the year, and that when there were flies on the water it would generally take them.

As regards external similitude, there is, of course, no real comparison to be made between the trout and the grayling, the latter bearing really a greater resemblance to the vendace, and

others of the herring-shaped species, or *coregoni*, and especially in the matter of the size of the scales which are large and chub-like, whilst the scales of the trout are exceedingly small, and in the charrs even minute. The basis of the colouring in the scales of the grayling is rather silver than gold, and when in the height of condition—that is, in October or November—and just taken from the water, he is certainly one of the most beautiful fish that swims. At this time the back is of a deep purple or claret colour, with small dark irregular spots on the sides ; the stomach is brilliantly white, with a fringe or lacing of gold ; and the tail, pectoral, and ventral fins are of a rich purplish tint. The dorsal fin is very large—almost disproportionately so—and is covered with scarlet spots and wavy lines upon a ground of reddish brown. The little ‘velvety’ back fin near the tail is also dark brown or purple, and the whole body is shot with violet, copper, and blue reflections when seen in different lights.

Properly to appreciate this colouring, the fish should be laid horizontally upon the hand to be looked at, in which position its varied tinting is seen to the greatest advantage.

The specific name, *thymallus*, or ‘thymy,’ is derived from a peculiar smell which is said to be possessed by the grayling, but which, I must say, appears to me to resemble rather the odour of cucumber than that of thyme. Its familiar name ‘grayling,’ is probably a modification of ‘gray-lines,’ having reference to the longitudinal dusky-blue bars with which its body is marked.

The grayling is essentially a local fish, and, as compared with the trout, may be even said to be rare, only certain soils being apparently suitable to its development—or, perhaps favourable to the production of the insect-food on which it in a great measure subsists. It thrives best in rivers the bottoms of which are composed principally of sandy gravel or loam. Rocky or stony bottoms are very inimical to its breeding ; and this is probably the reason why, though flourishing in many Continental waters, none exist, so far as I am aware, in those of Ireland or Scotland. Indeed, even in England, a dozen

names or so include all our streams which have any right really to be considered as properly grayling waters ; and these, with hardly an exception, belong to the southern and western portions of the island.

Some years ago the attempt to introduce grayling into the upper part of the Thames was made by Mr. Warburton, who turned in a considerable number of store-fish, but they never became acclimatised, and at last practically disappeared. The case is, no doubt, accurately stated by Mr. Blaine, when he says, 'Grayling require other peculiarities of location besides those of temperature, such as, for instance, the general character of the water they inhabit, and certain circumstances in the nature of its composition derived from its sources.'

It is probably owing to the absence of some of these requisites that the breeding of the fish in several rivers in which they have been attempted to be naturalised has not been attended with success. In some they soon disappeared ; in others they remained, but never thrived ; while in some waters, though they lived and at first increased, yet they were afterwards observed to shift their quarters to different grounds, in most of which cases it proved, as in the Test of Hampshire, that they emigrated from above downwards, probably in search of deeper and more tranquil waters. For the grayling-fisher cannot fail to observe that this species does not, like the trout, affect very rapid shallows and the coldest torrents ; on the contrary it seems to thrive best where milder currents alternate with deep and extensive pools. On the rapids, however—or 'stickles,' as they are termed—small grayling may frequently be found, but the large fish rarely, except in the spawning season.

The haunts of large grayling are the deepish and slow running tails of streams or pools, a few yards before the formation of fresh shallows ; and here they will be found *at all times*, except when spawning.

It will thus be seen that grayling are fastidious, not to say capricious, in their choice of habitats ; yet it has been proved by experiment that they will thrive even in ponds the conditions

of which are otherwise suitable. Such a pond, of an acre or so in extent, exists to my knowledge within a few miles of Ludlow. It is fed by a fine spring, and the grayling which were put into it, I have been assured, both thrive and fatten wonderfully. Unfortunately a reference to my notes does not enable me to say whether they also breed. As a rule it has been found by experiment that even in ponds where they will live—such as those, for instance, newly cut in hard soil or which have been recently and thoroughly cleaned—they do not breed.

Of the counties producing these fish, probably Herefordshire and Shropshire contain the best, as they certainly contain the most celebrated streams; the former includes the Dove, Lugg, Wye, and Ervon, and the latter the Clun and the Teme, distinguished as the head-quarters of the well-known Leintwardine Club.

In Hampshire and Wiltshire, the grayling is found in the Test, Wharf, and in both the Avons; in Staffordshire, in the Hodder, Trent, Dove, and Wye; in Derbyshire, in the Dove; and in Merionethshire, in the Dee, between Curleen and Bala; in Lancashire, in the Ribble; in Yorkshire, in the Derwent, Ure, Wharfe, and Whiske, near Northallerton; and in Cumberland, in the Esk and the Eden.

'Grayling,' observes Mr. H. R. Francis, 'are oddly distributed in the British Isles. I know of none in Scotland or Ireland, while in England the streams haunted by them seem capriciously distributed in groups according to no traceable rule. Yorkshire has many, chiefly to the north and east; Derbyshire many; Lancashire, as far as I know, only the Ribble. Southward, after an extensive *hiatus*, we have the grayling streams of Shropshire, and Herefordshire, and again not a few in the south of South Wales. There are good grayling in several of the principal Hampshire streams, and I think I have heard of a few in Wiltshire, but in the centre and south-east of England they are not to be found.'

Of the above grayling waters by far the finest streams are the Dove, the Lugg, the Test and the Teme. The last-named

river contains, in addition to some remarkably beautiful scenery, probably the best grayling water in the world—certainly in England ; and the Teme grayling has the reputation of being the first in the market. It was in the neighbourhood of the Teme, at Downton, that Sir H. Davy wrote his ‘Salmonia, or Days of Salmon Fishing ;’ and I have enjoyed some excellent sport on this river through the kindness of its owner, Mr. Boughton Knight, of Downton Castle.

Izaak Walton makes special mention of the Teme, in the neighbourhood of Worcester, for its remarkable grayling fishing.

It takes its rise in the Kerry hills, Montgomeryshire, and flowing through a wild pastoral country, a region of large, round, green-topped hills, thoroughly suggestive of shepherd life, but not presenting any very great attractions for the lovers of the picturesque, arrives at Knighton, and from thence flows past Leintwardine to Ludlow and Tenbury, finally falling into the Severn at Powick below Worcester. Throughout its course, or at all events from Knighton, the Teme is generally strictly preserved, more particularly from Leintwardine to Tenbury. The best grayling fishing is at Leintwardine, and from thence to Ludlow.

Mr. J. H. Cliffe furnished me some years ago, when I was editing the ‘Fisherman’s Magazine and Review,’ with some further particulars in regard to the best grayling fishing stations, which, as Mr. Cliffe writes from complete personal knowledge, may possibly be of interest :

Knighton, called by the Welsh *Tref-y-Clawdd*, meaning the ‘town on the (Offa’s) Dyke,’ is a good station for fishermen, more especially for such as prefer to roam unrestricted up into the wild moorland wastes near the source of the Teme ; but Ludlow, Tenbury, and a small place called ‘Little Hereford,’ are also excellent stations. At the last-named the trout and grayling fishing at the proper seasons is often first-rate. The banks of the river are, however, somewhat encumbered with trees. After Presteign, Knighton may be considered the first town in Radnor. It is well situated on a hill above the river, and to such as are fond of retirement and like wandering amongst wild hills, either in search of sport or antiquities, Knighton is a pleasant *gîte*.

I will now refer to the Lugg, a stream with which I am more intimately acquainted, and which is little less famous for grayling than its sister the Teme. Like the latter it has also a Welsh origin. It rises in Radnorshire, in the wild hills in the neighbourhood of Llangynllo, and after flowing for several miles a parallel course southward of the Teme, arrives at the neat, prettily situated town of Presteign, Llan Andras, the 'church of St. Andrew,' which is the capital of the county of Radnor. Presteign, however, is not entirely a Welsh town, as it is partly situated in Herefordshire, the River Lugg here dividing the Counties of Radnor and Hereford. It has a good market for agricultural produce, and living is moderate,—a *desideratum* to such as have only small incomes ; and to the angler Presteign is a most desirable residence during the summer and autumn.

From Presteign, the Lugg flows past Kinsham, between thickly wooded hills near Shobdon Court, the picturesque seat of Lord Bateman ; thence to Aymestry, Mortimer's Cross, and the pretty pastoral village of Kingsland. After passing Leominster its course is through a rich, level, fertile country, until it finally discharges itself into the Wye below Mordiford.

. . . Now through the wood
 We steal, and mark the old and mossy oaks
 Imboss the mountain's slope : or the wild ash,
 With rich red clusters mantling : or the birch
 In lonely glens light wavering : till behold
 The rapid river shooting through the gloom
 Its lucid line along.

The Arrow joins the Lugg a few miles below Leominster ; it contains grayling and trout, but to the angler it is of far inferior attraction to the sister stream.

Such being a brief sketch of the topography of the Lugg, I now come to the more practical question—where and how to find grayling fishing. From Presteign, to and below Leominster the Lugg contains grayling more or less numerous. This river is now almost entirely preserved from a short distance below Presteign, until it joins the Wye. I have met with excellent sport at Aymestry, and more especially at Kingsland, a charming retreat for the fisherman ; very comfortable although somewhat primitive and homely. Accommodation may be obtained at the village inn. Grayling are peculiar in their habits, and are only to be found in rivers abounding in rapids and scours, alternating with 'lanes' of

deep sluggish water. This is a characteristic which especially belongs to the Lugg, more particularly in the higher portions of its course, and in no part more so than in the water from and above Aymestry to Kingsland and downwards. You find the smaller, or what are locally termed the shett or 'shut' grayling, abounding in the scours or runs ; the larger fish keeping to the pools and deep still lanes of water.

There are, or were, two, if not more clubs on this river : viz at Leominster and Kingsland. To the latter club I formerly belonged, and although the members were professedly limited, yet there was not much difficulty in procuring admission. The subscription was a guinea a year with a gratuity to the keeper of the water, and each member of the club was entitled to give permission to a friend, should the latter accompany him. The club water extended from Kingsland for about two miles, and all, or nearly all, the water was sufficiently open along the banks for the purposes of the angler. At the village inn there is room for two or three anglers, and if further accommodation is required, private lodgings in the village can be obtained.

A mile or two further on from Kingsland, on the road to Wigmore and Presteign, we come to Mortimer's Cross, so called from a famous battle fought in the vicinity, between the adherents of the Houses of York and Lancaster. This village contains an old-fashioned but comfortable inn, and being in the immediate vicinity of the Lugg, is conveniently situated for the fisherman. There is excellent fishing-ground from Kingsland to Aymestry, but it is necessary to obtain leave ; for particulars we should advise inquiries being made at Mortimer's Cross. Aymestry, further on, is the *beau ideal* of a fisherman's home, in short *perfection*. Formerly, there stood near the bridge a very comfortable inn, consisting of a roomy parlour, and two or three bed-rooms, clean, although homely, with great civility and good fare. Since my sojourn there, however, I have heard that the inn is shut up, and whether there is now any accommodation for the fisherman at Aymestry, I am unable to say.

The scenery here, especially in autumn, is exquisite, the banks of the Lugg being beautifully wooded, and the branches in many places weeping over and even into the water. From hence to Kingsland by road is about three miles. The Aymestry water extends above bridge for about one mile. Above that the Lugg is strictly preserved by Lord Bateman.

There is one drawback to the angler : at the fall of the leaf the

water is frequently almost covered with dead leaves which attach themselves to his flies, and are a considerable trial to his patience.

A pleasant walking trip may be made from Kingsland to Shobdon, and from thence through the woods by a very romantic path to the banks of the Lugg, returning to Kingsland by Aymestry and Mortimer's Cross. Another agreeable excursion may be made from Aymestry to the old ruins of Wigmore Castle, which are extensive, and well worthy of inspection, and from thence to Presteign.

In weight the grayling rarely exceeds 3 lbs., and by far the greater number of fish taken are under 1 lb. Occasionally, however, they are even met with of even a larger size than the above-named: Mr. T. Lister Parker took three fish in the Avon, near Ringwood, which together weighed 12 lbs.; a grayling of $4\frac{1}{2}$ lbs. weight was killed in the Test, and one of 5 lbs. is recorded to have been taken in the neighbourhood of Shrewsbury.

Bowlker, in his 'Art of Angling,' says that the largest grayling he ever knew weighed $5\frac{1}{2}$ lbs., and Mr. Jones, who was well known to Ludlow grayling fishers as a most skilful and indefatigable angling attendant, tells me that he never knew or heard of a bigger. He himself caught one weighing 4 lbs. 5 ozs. in the presence of Mr. Walcott, of Bitterly Court. This was with a single hair and a gentle. The fish was stuffed by the late Dr. Buckley, of Shrewsbury. It is curious that though Bowlker was a Ludlow man, and doubtless a good grayling fisher, he does not mention the artificial grasshopper at all in his book. Jones claims to have been the first to introduce it, at any rate in the neighbourhood of Ludlow. In the Leintwardine Club there are only certain days of the year on which, if I remember rightly, grasshopper fishing is allowed, a precaution that may, perhaps, be necessary on club water which is liable to be assiduously and closely fished. The limit of size under which the Club used to permit the taking of grayling, either with bait or fly, was 10 inches.

In connection with this, the limitation of size, naturally occurs that of the growth rate.

One-year-old fish are locally termed 'pinks ;' at two years, when they weigh about quarter pound, they become 'shett' or 'shut' grayling ; and afterwards 'grayling.' The 'pink' grayling have neither spots nor lateral lines observable. 'Shett' grayling have spots, but no well-marked longitudinal lines as seen in the full-grown fish. At three years old the grayling weighs about half to three quarters of a pound in average waters, and is supposed by some authors to continue growing at about the same rate, viz. a quarter of a pound per annum, until reaching its maximum weight, which may probably be considered under ordinary conditions from four to five pounds. Other authorities, on the contrary, say that after half a pound the grayling grows fast, and that the next or fourth year he puts on another pound. A grayling weighing half a pound spawns, but a 'shett' grayling does not.

The ova are numerous, but considerably smaller than those of the trout, being about the size of partridge shot, and when seen in the rays of the sun, look very much the colour of the opal. The body of the embryo fish becomes distinctly visible in about nine days, and the egg itself hatches in fourteen or fifteen days from the date of deposit,—results obtained in the case of the eggs of the trout, in about thirty-five and fifty days respectively. The spawning time, as already observed, is in April and the beginning of May, the fish getting into condition in July, and reaching its prime in October and November, when most of the other *Salmonidæ* are going off.

Besides flies, worms, caterpillars, and the like, the food of the grayling consists of the larvæ of dragon-flies, May flies, and other ephemera, remains of the cases of the former and the skins of all of them being frequently found in its stomach. In the winter months the grayling will commonly rise at the fly from about twelve o'clock until two, if there is any sun.

Into the question of fly-fishing I do not purpose to enter, as it has been ably dealt with elsewhere in this volume by Mr. H. R. Francis. I may, however, add a hint which I believe

that gentleman does not give, namely, that when the fish refuse the fly at surface, *they will frequently take it if allowed to sink towards the bottom.*

Although instances have been known, and that not infrequently, of grayling taking the spinning minnow, it is not believed that they resemble trout in their minnow-feeding propensities, or that the minnow forms any important part of their dietary. The best mode of bait-fishing is undoubtedly with the gentle, either in connection with the artificial grasshopper, or on the hook of an artificial fly, or by itself.

To take the last first, gentle-fishing with the float is a most killing method of taking the grayling. Indeed, Jones, the fisherman aforesaid, whose experience is, perhaps, unequalled, has repeatedly told me that he considered it, on the whole, the most deadly method that could be practised and that it will not unfrequently succeed when all other baits fail. It is especially good when the water is too much coloured for flies. The *modus operandi* is as follows:—Take a long stiffish, light rod and a fine running line—such as Nottingham silk, for example—with very fine gut, or, still better (*pace* Jones), single hair float-line, and a very small hook, about No. 1 of my patterns, which should be baited with two gentles, never more. A float about three inches long and exceedingly light should be used, with a single good-sized shot, say No. 3, about three-quarters of a foot above the hooks.

The float should be light enough for this shot to ‘cock’ it properly. Choose a very quiet hole or swim, and plumb the depth; allowing sufficient float-line over to let the shot touch the bottom. For ground bait use gentles simply—either carrion or liver—and proceed to fish as if for roach, the only difference being that a little more time must be allowed in striking a bite and the stroke should be a very gentle one, as the mouth of the grayling is delicate. It is a good plan in ground-baiting to keep on throwing in a few gentles—say half-a-dozen or so at a time—so that the attention of the fish may be kept, as it were,

constantly occupied ; especially throw in gentles every time after catching a fish, *or even when one has been hooked or lost.* Indeed, if you are sufficiently nimble to accomplish the feat, it is a great element of success in making a bag to throw in ground bait while the fish is actually being played—a plan which I have also adopted with success in roach fishing.

By following out the above method, the grayling fisher may often catch nearly every fish in the hole or swim, and sometimes very heavy specimens. Half a pint of gentles are enough for one day and one rod, but I think half a quart is still better.

For this style of gentle fishing the Nottingham method is particularly deadly, and I have been assured that Worcester fishermen lower down the Teme, by Tenbury, and so on, make large takes of grayling in this way, using a float almost big enough for jack ! For an account of the Nottingham style of fishing see Vol. II.

Ludlow was the head-quarters of the old school of 'gentle fishers,' but of late years this method has dropped much into disuse, although still occasionally practised. The masters of the art of grayling fishing with gentles always preferred hair to gut, as being finer, less visible, and longer in the strand, also because it never 'frays or frets,' however much it may be used. It also floats, which is better for some reasons for the play of the gentle, and probably makes it less likely to catch in the ground. Its use, however, is confined to gentle fishing, being unsuitable both for the fly and grasshopper ; in the latter case not being strong enough, and in the former its 'flotation' being an objection, inasmuch as many grayling take the fly under water, as I have before pointed out. Gut, of course, sinks instead of floating.

The hair for the purpose indicated should always be taken from an entire horse.

These notes on grayling fishing with the natural bait would be incomplete without a reference to a somewhat local, perhaps, yet as practised by its professors, apparently a very deadly

method of using the worm, somewhat after the 'Nottingham style.' As I have had no personal experience in this branch of grayling fishing, I have taken the liberty of quoting from an able article on the subject, which recently appeared in the 'Fishing Gazette,' by Mr. Francis M. Walbran.

The author of a 'Book on Angling,' observes this gentleman, makes the remark that 'As the grayling is such a sporting fish, and so free to rise to all comers, it is a disgrace and a shame to treat him like a poacher, with worms and such abominations. Now, this may be all very well when you are dealing with the denizens of Hampshire or Derbyshire streams, where fly-fishing may be carried on almost into winter with reasonable expectation of success; but anybody who pays a visit to any of our Yorkshire rivers after about the middle of October will find that, if he intends to kill anything like a respectable dish of grayling, he will be obliged to have recourse to some other method of luring them than the artificial fly.

My object in writing is to explain to those of my readers who may be unacquainted with it, the favourite mode of fishing for the grayling adopted by anglers in this district during the winter months, and which is termed by them 'swimming the worm.' As regards sport, I consider it little inferior to clear-water worm fishing for trout, and I venture to predict that any angler who may try his hand at it and become an adept, will come to the conclusion that it is equally a scientific amusement.

The weather ought to be bright and frosty, with the water low and clear, to ensure success in this fishing. Melted snow or 'broth,' as it is called, immediately spoils sport, and if the rivers are at all flooded through rain, you are unable to get to the places where grayling usually frequent, and, in addition to that, they never feed really well in either a rising or falling state of the water.

The rod should be about eleven feet in length, light, and inclined rather to stiffness, but not too much so. An ebonite check reel, with a fine braided waterproofed line, completes that portion of your equipment, so we will now pass on to the tackle, then to the consideration of bait, and finish up with a description of the *modus operandi*.

Prepare a cast three yards in length, tapering down to the finest drawn gut procurable, and on this wrap with red silk a No. 4 fine wire round-bend hook, with a piece of stiff bristle projecting

out about one-eighth inch from the upper portion of the shank ; weight the tackle with a single swan shot attached to the line about 12 inches from the hook ; the float should be made of cork about the size of a marble, with a hole bored through the centre, and an adjusting plug of either quill or wood.

Opinions seem to vary as to the most suitable kind of worms to employ, some preferring the brandling, others the small red worm found in rotten leaf mould, which is known as the 'cockspur' in some districts ; and, as far as my experience goes, I have always found the latter prove the more attractive bait of the two.

Insert the point of the hook into the worm about one-eighth inch below the head, and thread it up the shank over the projecting piece of bristle, which will keep it in its place, allowing the tail of the worm to hang straight down, with the point and bend of the hook exposed. As a general rule 18 inches is about the proper depth at which to adjust the float, so that the worm may swim 3 inches or 4 inches from the ground ; but, of course, it all depends upon the stream in which you are fishing.

All being now ready, let us adjourn to the river, and look out for a likely spot in which to commence operations. As I write I can picture just such a place in my mind's eye—a stream upon my favourite river—the Yore. It is perhaps half-a-mile in length, having a uniform depth of about 2 feet, excepting at the tail of it, where it runs gradually off into a deep pool. At the head of the stream it is rocky, the water running sharply round the moss-covered boulders, forming below them those quiet little eddying pools that grayling especially affect. Step into the edge of the stream and letting out line to about the length and a half of your rod, cast your worm lightly just above that rock ; jauntily rides the tiny float into the eddying pool below, and just as it is veering round a slight stoppage occurs—only for a moment, however, and then moves on as before ; pull out and examine your bait. Ah ! I thought so. The tail of your worm is gone ; that was a grayling, my friend, and the next swim I will wager anything that you 'nail' him. Another cast ; once more the float stops in exactly the same place, but this time drags as though the hook had caught in the bottom. Now, then, strike with a firm turn of the wrist—*habet!* a good fish, too, to judge by the resistance that he makes. Gently, gently ; do not hurry him. The tackle is fine and his mouth tender. There, he turns on his side at last ; slip the net under him and transfer him to your basket.

Just a nip of 'Scotch' to commemorate the first fish, and then proceed cautiously down stream, trying every likely place within reach. Towards the end of the stream we approach a belt of willow trees which fringe the water's edge. Under the shade of their pink roots many a lusty member of the *Salmo Thymallus* family has his home. Let out a long line as in roach fishing, and allow your bait to swim down about half a yard or so from the side. There goes your float. No mistake about that bite, as the merry music of your reel testifies, the fish taking out line rapidly. A 'pounder' this time, and if some of our sceptical friends who deride the idea of a grayling being comparable to trout, as regards game-ness, could witness or experience the 'play' of a fish like this, hooked upon drawn gut in the height of season, I fancy that they would alter their opinions somewhat.

But the struggle comes to an end at last, and as you dip him out of his native element in your net you cannot help but admire his perfect symmetry and beautiful colouring. How handsome he looks as he lies on the frozen grass, the rich crimson of his large dorsal fin contrasting so well with his black back, and the green and purple sheen of his silvery sides with the milky white of his belly.

But come along ; we must waste no time, for the days are short at this season of the year. Past the willows we come to a shelving bed of sand and gravel. Cautiously now, my friend, for this is the best swim of all. Over that bar of gravel the stream runs into a deep pool ; adjust your float a little deeper, and proceed as before. No result the first attempt ; your line is out at full stretch ; the float drags on account of the sudden check, and you prepare to pull out for another swim. But before you are almost aware your rod top receives a sudden jerk, and your line comes back to you *minus* the hook, perhaps the float as well. It's no use, however, 'crying over spilt milk,' and I will tell you how to avert the disaster in future. In such a place as this when the float gets to the end of the swim, the hook, being lightly weighted rises with the current, and the grayling, coming from below, snatches at it, and snaps the fine drawn gut with the sudden jerk. Never, therefore, keep your finger on the line, also take the precaution before withdrawing to give a gentle strike, in which case should a fish have taken your bait without giving any indication through the medium of your float, you generally succeed in landing.

The artificial grasshopper so called, fig. 1, is merely a rough imitation of the common green caterpillar, dressed over a small piece of lead to carry the bait rapidly to the bottom ; a couple of gentles or so being stuck on to the point of the hook. No float, properly so called, is used, but only a miniature substitute intended to rise and sink with the line, but at the same time to give the fisherman an idea of the depth and position of his bait. B, in the woodcut, fig. 2, represents the sheath or 'cap' of quill, into which slips a fine piece of solid quilstem,



FIG. 1.—ARTIFICIAL GRASSHOPPER.



FIG. 2.—GRAYLING 'FLOAT.'

A A, cut of a thickness to fit it accurately. The line of course passes between A and B, and is shifted according to the average depth to be fished.

The 'grasshopper' is worked simply by a 'sink and draw' motion—allowed, that is, to go down to the bottom, and then drawn up again about a foot or so as before. The stream is usually strong enough to shift the bait as much as is desirable; but if the water be too still for this, the result can be arrived at by 'drawing' the bait a little to the right or left with the rod, as I have pointed out in the 'Modern Practical Angler.'

The great point is to be quite sure that the bait does touch the bottom before drawing up.

A run will of course be perceived as the bait is being drawn up, when a smart stroke should be given, and the fish held tightly. Otherwise from its non-fighting propensities, a large grayling is very likely to get off; the hook also is a good deal encumbered with gentles. When first struck, the larger grayling appear to me to fight as an eel fights—pulling tail backwards, instead of running down or away, head first, as other fish generally do; and I hardly ever remember seeing a hooked grayling spring out of water.

The best spots for grasshopper fishing have already been described. Where the water is deep enough, a short line worked almost perpendicularly near the bank will be found most successful: but by throwing out a considerable distance, excellent water otherwise inaccessible can often be reached. The cast may be made over-hand like a fly to a distance of some ten yards, but care must be taken to allow the line to spread well behind, or otherwise the bait will perform various eccentric flights into the bank or bushes. A longish light rod, say fourteen or fifteen feet, is most convenient for grasshopper fishing; and a fine running line which is not much liable to be acted upon by the current.

As a rule, fish caught with the grasshopper are twice as large as those caught with the fly. September, October, November and December are the best months, and the best days are usually quiet warm days succeeding frosty nights—in fact, grasshopper fishing never fairly gets into play until the first sharpish frost. From about 8 A.M. until 4 P.M. is commonly the best time of day. The proportions of a Teme grayling of about one and a half pounds which I measured were:—total length of the head, body, and tail-fin being considered as five and a half, the length of the head alone as one. Depth of body slightly greater than length of head; tail forked. As in all members of the salmon family, the grayling has two back fins, the second adipose or fatty.

Number of scales in lateral line about eighty-seven.

THAMES TROUT-FISHING.

LOOKING at the dear old Thames from an angler's point of view, I must admit that within my memory the range of 'fish-able' water has been considerably reduced. I have made many a good basket of roach and dace off the piles under Putney Bridge, where the water was then clear enough to support a fair sprinkling of barbel, and I have caught half-a-dozen different kinds of fish off the bank of Ranelagh House, where I lived as a boy, from grounds lately united to those of the Hurlingham Club. The roach-fishing at Battersea Bridge, if I remember, only ceased about the year 1827, and from that date the limit of rod-fishing gradually receded up the river. There has, however, since the formation of the Thames Embankment been a re-appearance of scale-fish down the estuary, and though the increased traffic forbids the renewal of punt-fishing, yet in certain states of the water resolute urchins contrive to extract a few of them as low down as Chelsea Bridge. From Teddington upwards the angling may not be quite what it was in my boyhood, but if we could have an authentic summary of all the fish taken in the course of a year between the tidal boundary and Wallingford, the number, weight and variety of the captures would, I think, astonish some facetious contemners of Thames fishing.

My present concern, however, is with one only of its numerous branches; the one, perhaps, which has suffered least from increased traffic and the disturbance of the stream. The haunts of the Thames trout lie for the most part outside the course of lighters and steam-launches, and where the run

of the water is too strong for any but the most athletic sculler. Moreover, the various societies which have taken part in the preservation of the river have given special attention to keeping up—and in some cases getting up—the stock of trout. What remains yet to be done for the better attainment of these objects I shall try to show towards the end of this paper. For the present, I will at once address myself to the ways and means of capturing Thames trout which my own experience has recommended to me.

I ought however at the outset to make two admissions which will go far to 'disable my judgment' in the eyes of many skilful London anglers. My experience is 'ancient' as well as 'fish-like,' having been acquired almost wholly in the years from 1844 to 1854 inclusive. I have, it is true, twice within the last few years tried my old casts with the fly for a few hours, and both times with success, but I have 'lost touch' of many parts of the river with which I was once familiar. Again, I can only claim to have known well the trouting capacities of the river between Pangbourne and Bray Weir, and have but a general knowledge of those lower reaches in which the trout are heaviest and most highly educated.

There was a story current some thirty years ago of a gentleman who took boat at Chertsey for his first day's assault on these wary giants, and favoured by weather or water or that mysterious power called 'luck' brought home two noble trout, 'the likes' of which he had never seen. He lost no time in leasing a Thames-side villa, the hall of which he already beheld in his mind's eyes decorated with a goodly array of similar water-trophies. But during a two-years' tenancy he never killed another Thames trout.

Similar experiences, however, were not unknown in what I may call the 'middle waters,' my own special beat. I could mention men well-known in the angling world who were constantly baffled in their attempts to secure a trout from Father Thames. I shall never forget the reply made to me by a dear friend and sporting companion of my own—beyond question a

skilful trout-fisher, with a quick eye and nice hand—when I requested him to fish with me on the opening day of the trouting-season. ‘No, F.,’ said he, ‘it won’t do. I have done with toiling and spinning. Three seasons have I fished for Thames trout. I have been broken five times. I have taken but one trout, weighing one pound, and *that* the cat ate!’

The climax was so comical that I forbore to ‘saddle him with a judgment’ for basketing a fish under size.

His record—a strictly true one—was certainly not encouraging. Yet in spite of this and other kindred examples, or—as some would say—warnings, I think the difficulty of taking trout in the Thames is a good deal exaggerated. My own experience, I am told, has been exceptionally fortunate, and if I stated its general result I should hardly expect to be believed by those who do not know me. It will be more to the purpose to point out the reasons which seem to me to account for an unduly low average of success and the details of practice which I have found useful; citing my own record only when it has some distinct value as illustrating a principle.

In the first place it appears to me that Thames trout-fishing as commonly practised is too much an affair of weirs and floodgates—of spinning hour after hour in a strong rush of water, at, or near, the same spot. No doubt a good hand, with abundant leisure may, if he steadily haunts two or three good weir-pools on likely days, make certain of a few fish in the course of the season, and those, mark you, good ones. Moreover, if he likes to take things easily, he will have less severe and continuous work than he would encounter in fishing a series of heavy streams broad-cast with the spinning-bait, with an average of something like forty yards to each throw. Nor again is his sport wholly monotonous when he is not actually fast in a fish. I never could make the first cast of the day in the central rush of a good weir without a stirring sense of expectation. And when a goodly trout shows himself well on the feed within reach of the weir-fisher’s station, there is no slight excitement in the attempt to guide the spinning bleak or gudgeon so as to

cross his beat attractively. But 'for a' that, and a' that and twice as much as a' that,' give me the open stream-fishing in April and early May, and the fly later in summer forenoons and evenings, for the cream of Thames trouting.

The second cause, which seems to me to increase the inevitable difficulties of this sport, and to limit the number of captures, is that spinning for Thames trout is too commonly regarded as 'a thing apart'—utterly unlike the minnow-fisher's sport in other waters, and to be invariably pursued with the heavily leaded trace, showy bait, and elaborate flight of hooks which are needful in working strong and broad streams, but those only. Let me give an example to illustrate my meaning.

About forty years ago I made my first acquaintance with the trout of Father Thames. I had recently taken a cottage at Hurley, hard by the second lock above Marlow, and wished to know what could be done in that neighbourhood at my favourite sport. It was the ominous 1st of April, and so unfavourable was the weather that old Andrews, whose services I had secured as boatman, broadly hinted that I had better have stayed at home. Never since have I seen the river so low at that season, and the day was so exceptionally warm and bright that I was fain to fish in my shirt-sleeves, as if it had been midsummer. There were four other boats out in the reach below Boulter's Lock, and my soul was vexed to see the dashing and plunging of baits and leads across the broad sunny shallows; far more calculated, I should have supposed, to scare than to attract a trout of average intelligence. I at once made up my mind to have nothing to do with the Thames spinning tackle, and fitted up a cast arranged in the fashion which I had found killing in a score of smaller rivers. It consisted of a small lead to lie within the belly of the bait, to which was attached a lip-hook with two eyes, while on a separate length of fine gut were two triangles. These were threaded with a long needle through the bait, so that the larger was drawn up close to the vent, while the smaller hung just by the bait's tail. I baited with a gudgeon scarcely larger than a

minnow, and when its mouth was closed over the lead by the lip-hook, and the link, with the triangles, passed through the 'eyes' and looped on to a fine trace with two swivels, I felt that I had a tackle suited to the brightest water, and capable of being dropped without disturbance in any quiet nook. When I explained my scheme of tactics to my veteran boatman, I fear he took much the same view of my character as the matron at Shrewsbury School did of Master W—— whom she declared to be the most 'poke-into-every-hole-and-cornerest boy she ever see in her life!' But his punting to suit my short, quiet casts was simply perfection. I had but to indicate the spot where I hoped to find a fish, and without splash, stir, or apparent effort, he placed me within easy reach of it. Now it would be a deep rush through a ballast hole; now a dark eddy behind a barrier of roots; now the quiet water under the further side of a mill-shoot; but whatever the difficulties of approach, Andrews never threw a chance away. The outcome of all our manœuvring was, I confess, very gratifying to me as a novice in those waters. I got four fish—not 'boomers,' certainly, for the largest was just under four pounds; but all takeable—and three of the other boats had but one small trout between them, nor could I learn that the fourth, which went off down stream, had carried away any spoil.

No doubt, with ordinary water and weather, the results would have been very different. The fish would not have lain so close, and the caster who covered most water would *ceteris paribus* have had the best chance. Still, that day's experience showed me what is the weak point of the ordinary Thames spinning-tackle. It is not good for exploring a deep hole or a sheltered nook, and I believe much might be done, after fishing the streams in a likely reach, broad-cast, by changing the tackle, and fishing out the odd corners without any lead outside the bait. As the season advances, especially if the summer be a warm one, spinning across the open streams becomes almost useless, unless just at twilight, and the angler who wishes to troll for trout beyond the weir-pools, will do

well—to borrow a word from Mr. Chucks—to *mitigate* his tackle.

For my own part, however, I enjoy Thames trouting most when fishing the open streams with heavy spinning-tackle at the beginning of the season, and the livelier runs with the fly towards its close. I shall therefore direct my remarks chiefly to these two phases of the craft, adding, however, a few pages with regard to its other branches.

Let us suppose it the 1st of April, and that you are determined to kill a Thames trout or two, and not be yourself a '*poisson d'Avril*.' You will of course have secured a first-rate local boatman some days before, as, however well you may know the water you have fixed upon, much will depend upon his experience and judgment. I have never countenanced the common practice of allowing my hired fisherman to angle either with me or for me. I don't put this as a matter of principle; it is with me, no doubt, rather a question of temperament. I have made up my mind to kill a trout, and have found that a strong will in this, as in other matters, goes far towards success. But were I to fail, it would be anything but a consolation to me that my boatman had a ten-pound prize in the 'fresh-water lottery,' whilst I had drawn a blank. Nor of course could I expect the full benefit of his knowledge with regard to the exact haunts of particular fish, if I knew that he was afterwards to try the same water for his own honour and glory. I have known many Thames puntmen well, and very fine fellows I have found them, but one must not expect too much from human nature. On the other hand, I admit to the full my boatman's important share in the day's success. In the ancient British wars the chief drove the war-chariot, while his retainers fought from it. And if anyone contends in like manner, that the man who guides the punt plays a higher *rôle* than he who wields the rod, I should not care to dispute the point. Only when I have undertaken the spinning department I insist on keeping it to myself. My boatman always seemed to understand this, and I think liked me the better for being so dread-

fully in earnest. Of course I took care that they should have some 'solid pudding' to set against the loss of empty praise. I took a hint from the dealings of the 'Angler in Norway' with the peasants who worked his boat, and made every sizeable trout I took, a 'specie fish.'

Your boatman secured—and there is no lack of skilled hands from Pangbourne to Teddington—look well to your tackle and bait. Let your trace be of round, clear gut, of reasonable, not excessive, thickness. Some anglers by way of being on the safe side use gut of preposterous strength, nearly as opaque and as conspicuous as gimp. Such tackle throws away chances in clear water, and is, in any case, superfluous. I don't believe in sound gut of medium thickness being fairly broken under ordinary circumstances, by any trout up to a stone weight. No doubt if a heavy fish gets you unawares round a pile or a root—thus getting a dead pull unrelieved by the play of the rod—something must give way; probably the hold, or the hooks, or a treacherous knot, but very possibly a link of your gut, however stout; frayed, perhaps, in rubbing against the hard-edged wood. The case is hopeless for any tackle short of a cart-rope and a meat-hook. I ought, however, in candour to mention one case in which a trace of what I should condemn elsewhere as excessive strength may conceivably prevent an 'imminent deadly breach.' A trout will occasionally dash up from the deeper stream below, to where the water is foaming over the apron of a weir, and the bleak are flashing about in heedless play. If he takes your bait in such a place, his first rush is sure to be exceptionally strong, as he is in all haste to escape from his exposed position, and often puts extra weight into his pull, from being half out of the water. Under these circumstances, line should be given instantly and freely, but the angler who is taken by surprise, and holds too hard, may have the luck to save his fish by tackle of *maximum* strength. Yet as to a fair break even in this case of a powerful fish's greatest advantage,

I rather tell thee what is to be feared
Than what I fear.

It has been my luck never to be 'broken' in Thames trout-fishing. If, however, I have not cared to use the very thickest gut, I have been most careful to look to my knots, lapping them with fine floss silk, secured by a setting of copal varnish ; nor have I ever used a trace, without first testing it by a dead strain of four or five pounds.

The proper leading of the trace I must leave to the angler's own judgment and experience. Generally speaking, it should of course be weighted in proportion to the depth and rapidity of the water to be fished. A light lead will be useless in a strong deep channel, a heavy one will be out of place over a shallow. Occasional changes will therefore be necessary, and I need hardly say that Piscator should be provided with leads of various weight, threaded on gimp or wire, with a swivel at each end, and ready for looping on as occasions required. In ordinary practice, however, it will be found easier to change the whole trace than to shift the lead, and he should therefore have a light trace as well as a heavy one always ready to hand. These will be found practically sufficient, as the sinking of the lead in either case can be considerably modified by raising or lowering the point of the rod, and by quickening or retarding the gathering in of the line after each cast.

The distance of the bait from the lead is another matter which requires attention. My own practice has been to make this distance somewhat greater than is usual with the generality of Thames anglers. Three feet and a half seems to me not too long an interval, except perhaps in fishing the head of a weir-pool. Greater variety of sweep is thus given to the course of the spinning bait, and it receives more life-like impulses from irregularities in the force and direction of the current.

I must not wholly pass by the much-discussed question, 'What is the best form for a flight of spinning-hooks?' Yet after a great variety of experiments, I cannot pretend to give a decided, much less a decisive reply. I am rather tempted to answer evasively, 'Use the flight with which you—or your boatman if he baits for you—can make your bait spin best.' You want to

make your line to revolve quickly enough to conceal your hooks, and to reflect the light brilliantly as it moves, thus inducing the trout whom you 'go for' to take it freely and boldly. If the inducement offered proves sufficient, and a good fish seizes your bait in earnest, there is little doubt of your holding him securely whatever 'formula' of hooks you may have adopted. Four or five times in the course of my Thames spinning, I have indeed felt a hasty touch, like that of a short-rising fish on a fly, denoting a timid or half-hearted attempt on the part of a suspicious trout, but once only did I lose a fish fairly 'held,' and then, I believe, through my own fault. But though my experience leads me to attach little importance to the arrangement of hooks in detail, it may justify me in recommending one particular flight, with which I have killed scores of fish, if not as the best yet at least as sufficiently effective, both for the spinning and the hooking. It includes ten hooks; first one, sliding very stiffly, for the lips of the bait; then a triangle nearly an inch lower, consisting of one lip-hook for fixing in the bait, and two, Limerick for choice, forming angles of 120° with the fixed hook. Next come two, back to back, one being a lip-hook for holding, while the other stands rankly out; then another triangle like the first, and finally, close below this, a Kirby hook, shortened in the shank. These properly applied, will give the bait the true form for rapid and regular spinning, and will enable it to maintain that form for half an hour or more of constant throwing if you are skilful enough to avoid checks or jerks. I must, however, admit that this 'true form,' which begins with a straight line and ends with a gradually increasing curve, is not easily attained in baiting a bleak. Bait fish whose bodies are nearly cylindrical, like a baby chub or dace, or that best of lures on a bright day, a small gudgeon, revolve easily and steadily and need comparatively little skill in placing them on the hooks, but your flat-bodied bleak is a ticklish subject to deal with. The curve must be very true; the holding hooks must sit very close, or the result will be an unsightly wobble. I confess to having wasted scores of bleak, or at least left them fit only for eel-lines

in the attempt to fit them on hooks such as I have described. Even when practice ought to have rendered me fairly expert, I think that out of five bleak of my own baiting two would have spun well, a third perhaps passably, while the two others would have been complete failures. In fact, unless I had plenty of time before me I used to make the baiting department over to my skilful and trusty crony Tom Rosewell, than whom no better hand ever guided a punt or dealt with the niceties of tackle.

The special difficulty of the flight of hooks which I have described, with perhaps needless minuteness, lies in fixing accurately the hooks at the tail-end, where you must begin your baiting. Directions as to the mode of doing this would be so much waste of paper. One hint, however, may prove useful. Knock your bleak on the head—a sharp flip with the nail of your middle-finger will suffice—and let him stiffen for a few minutes before you bait him. I have seen many a one spoiled by a hurried attempt to ‘fettle’ him before muscular motion had completely ceased.

I have often been asked, ‘Why so much care as to the true and rapid spinning of your bait? Are not heavy trout often taken with a big wobbling dace, utterly unlike your brilliant ideal?’ Such cases, I admit, do occur; rarely, however, and chiefly in deep eddies and a clouded water. I remember taking one myself on the 31st of March (then the last day of the pike-fishing season) with gimp tackle and a full-sized trolling bait. He was a lovely fish, as bright as a star. I guessed his weight at 6 lbs., but he never came to scale, for I thought myself bound as a zealous member of a local angling association, not to take a trout before the 1st of April. But I would gladly have eased my conscience after the fashion of a worthy Australian friend, a sporting J.P., who shot a fine bustard out of season, on his way to a magistrates’ meeting and opened the proceedings by paying a guinea fine. This, however, was the only instance in which I ever took a Thames trout in spinning for pike, and the water was clearing after a flood. It did not

in the slightest degree shake my belief in the attractions of a small bait, revolving swiftly and steadily.

A few words now as to the best mode of fishing the streams where you expect to find trout. If the run be a straight one with the likeliest water in mid-stream, let your fisherman drop his punt quietly along shore, choosing his side as best suits the sun and wind, and make your casts across or slightly up the stream, repeating them at regular intervals of three or four yards. Drop your bait on the far side of the stream, and bring it steadily in a downward sweep across the best of the water. Let it be a standing order to your boatman the instant you have hooked a fish to get below him.

When instead of a straight run the river makes a strong curve, boring under the concave bank, my practice (not, I believe the usual one) is to hug the side where the current sweeps in, and to cast over to the quieter side of the stream, so as to show my bait last in the strongest of the water. Never fail, as you gather in your line before lifting your bait for another throw, to turn your rod-point over, so that the bleak or gudgeon may make a sudden swerve and momentary pause within a few feet of the bank. It is at this moment that your chance of a capture is at the best. Perhaps a fish has followed your bait right across the stream, perhaps he has just sighted it from under the bank; in either case he thinks it is now or never, and makes his dash with a will. In my experience of stream-fishing on the Thames, I am sure that more than half of my trout have been hooked just at this critical turn, which a careful angler should never omit.

I do not think Thames trout are particular as to weather, but in a cutting North-Easter there will be little chance except in sheltered nooks when the bleak show at the surface. I remember getting a fish on a 1st of April—my last ‘opening-day’ in the Marlow water—in the middle of a snow-storm, and in as cruel a wind as I ever faced. I had tried two or three favourite streams without a touch, and was for retreating when the snow came, loth though I was to begin the season for the

first time without a kill. But Rosewell, who was with me then for the last time, urged me to carry on fifty yards further. He had seen some bleak playing 'behind the bush at the head of the Black Hole.' I knew there was always a fish there, and thought it worth trying. Sure enough I killed a four-pounder just at the particular point indicated ; and I well remember with what glee I scrambled ashore and hurried home as fast as chilled limbs would carry me. Never before or since have I fished on such a day. The best chance for spinning on the Thames is doubtless on warm days, with frequent gleams of sun, when the small fish are sporting everywhere, and the trout on the lookout accordingly.

If the weather be warm and sunny, you need not be frightened by a thick water, if it be anything short of the pea-soup complexion. It may be harder to find your fish, but he is surer to take if the bait crosses his sight. In a strong clouded water you will often do well to quit your boat and fish from the shore, guiding your bait in and out of the nooks and hollows of the bank where the stream runs strong in the sunlight. If you know of a good fish usually lying in mid-stream, look to find him in such weather and water feeding at intervals in the nearest shallow bay, and unusually open to conviction.

In spinning for Thames trout you will frequently take other fish. Pike that have not yet spawned often cut your tackle in April, but nearly as often come to grief themselves. They are feeding sluggishly and daintily, and merely lip the bait. I once killed one of eight pounds on the 1st, which lay so dead that my puntsman vowed I was foul of a stump ; but it proved to be a female fish, very heavy in roe. Occasionally I have taken a perch in spinning ; many times a chub. Once only I took a barbel ; he weighed about $7\frac{1}{2}$ lbs., and gave me much trouble at first, and a cruel disappointment towards the close of our struggle, when his peculiar movements left no doubt as to his quality.

Next to spinning the streams in the early part of the season, I have most enjoyed fly-fishing for Thames trout after mid-

summer. My opportunities of trying this phase of sport have been limited, but when I have tried it I have rarely failed. And I think true anglers will agree with me that if you *can* kill with the fly there is no method so entirely satisfactory. The work is so clean, so light, so simple, yet at the same time so artistic. You have no struggle against the perversity of baits that won't spin, the sliminess of villainous lobworms which it vexes your finer instincts to put on the hook. You are in active exercise throughout, yet escape the monotonous and sometimes wearisome exertion of a long bout with a spinning-rod, where cast must follow cast as regularly as the strokes of a steam-engine, yet each must be regulated with the nicest judgment. If you are a practised hand—and I would hardly recommend a novice to seek his trouting in the Thames—you will wield your 'two-handed engine' easily and confidently, with no misgiving as to where or how your fly will fall. You will be instinctively accurate in dropping it now behind some root-bound projection of the bank, now in the foam of an eddy, now where a clod or a stone forms a break in the gliding shallow.

Fly-fishing on the Thames is much like fly-fishing in other rivers, only—as the Kentucky man said of Sunday in his State as compared to other days—'rather more so.' The fish being fewer and larger, their haunts will be not merely in good places, but in the very best; such as you have found the master fish select for themselves in well stocked rivers. The tastes and habits of large trout vary little in this respect. I remember being very much struck when in Tasmania by the certainty with which I could *spot* the large trout, bred from British ova, while there were yet but few. There was a beautiful tributary of the Derwent, known as the Russell's Falls River, in which several good fish had been seen though none yet taken. On a promising day when the water was slightly coloured, I reconnoitered some 500 yards of this stream, fly-rod in hand, in order to mark the most promising casts before commencing operations. The result of my scrutiny was that at my very first

throw I hooked a three-pounder, whom in spite of great local difficulties I succeeded in landing. Precisely the same thing happened to me in another fine Tasmanian stream. In these waters, as in the Thames, the fish were large but scarce, and my success was simply due to my assuming that they must therefore be sought not merely in likely places but *in the very likeliest*. In these few words lies the secret of effective fly-fishing for Thames trout.

But what are the 'very likeliest' casts? I have already said that the selection of these must depend on the extent of the angler's experience and the closeness of his observation. It is impossible to define. But a good trout is often to be found at the head or tail of a hollow-banked eyot where the stream runs strong. And there are few surer finds than a 'ballast-hole' in a bright gravelly shallow, or the similar hollow at the back of a last year's redd. In such spots the trout can 'lie low,' like Brer Fox in Uncle Remus, and there is always break enough in the water to disguise the tackle. I may mention that I have thrown a fly for a Thames trout only twice since my return from Australia ten years ago, and on both occasions have taken a pretty fish from one of these favourite haunts.

A great deal of fuss is made about flies for the Thames. I remember being asked by one of our fashionable tackle-dealers eighteen-pence for a mere soldier-palmer tied on gut which might have scared a crocodile. And I have had all sorts of special 'tips' recommended to me in the shape of certain combinations of feather silk and tinsel warranted irresistible. But as far as my own experience goes, your Thames trout is by no means particular about his fly, provided that it be a good mouthful with a sufficient play of wings and legs to make its movements life-like. I think if I had to fix on a standard cast my tail-fly should be a large Alder-fly, with plenty of brown drake feather for wings, legs of a dark hackle and a pretty substantial body of peacock's herl. My dropper—some five feet higher up, and hanging five inches clear of the casting-line—should be a dark-

rooted red hackle, ribbed palmer-fashion with gold twist. But any first rate lake-fly ought to kill in the Thames.

I once talked over this question with a zealous brother-angler during an afternoon chat. On my telling him that I thought a good dark-winged Professor would do the trick, my practical friend at once said, 'Let me see you tie one.' I remember perfectly the fly I turned out then and there on a grilse hook. The wings and tail were brown drake, legs a dark-red hackle, body orange silk ribbed with gold twist, just such a fly as I would have liked to throw on a Scotch loch where the trout run heavy.

'Now,' said my friend—still 'nothing if not practical'—'let us walk down to Marlow Pool and try it.'

We found the water very low, so that after just stepping on a punt to cross one narrow channel I found myself commanding the tail of the pool from a firm step of dry gravel. At my third throw I hooked a good fish, who lost no time in tiring himself by boring up stream. I had not even brought a landing-net, but Sir H. Heinrich—himself a very successful Thames angler—who was barbel-fishing under the central weir-stream, dropped down and landed my fish for me. It weighed about $5\frac{1}{2}$ lbs., and as perfectly shaped a trout as I ever extracted even from the Thames. I have since found other lake-flies killing; notably, one of my special favourites, tied with jackdaw wing, black hackle and claret body. Still, I rather prefer the cast of flies first named, both the alder and the red palmer being deadly lures for large chub, of which I seldom fail to secure a fair number near the haunts of the nobler fish.

There is one other fly—the 'White Moth'—which I ought perhaps to name in connection with Thames trout. I hardly ever fished the river late, but on one occasion I found myself lingering after dusk, at the close of a glorious July day, in hopes of adding a third fish to two already in the well. Fish of all kinds had been a-stir, drawn to the surface of the Bray water by an extraordinary insect cloud formed by millions of the 'Yellow Sally,' and as the light waned, the whim seized me to

try a white moth over the sharp shallow below the weir-pool. Just at ten o'clock I found myself fast in a three-pounder, whom at first I fondly imagined to be a much larger fish. He certainly pulled in grand style, rushing in the most headstrong fashion up and across the tail of the pool, whilst I could merely hold him tight and guess his whereabouts by the curve of my top-joint dimly seen against the darkening sky. It was really an exciting struggle ; almost too much so to be pleasant, for the water was very strong, and what with gazing skyward and the heaving and swinging of the punt I was fairly dizzy, and had to drop on my knees to avoid the imminent risk of going over-board. Rosewell however punted splendidly, as indeed he always did, and contrived throughout to keep below the fish, whom he at last landed at half-past ten. As this was the only instance in which I ever threw a white moth on Thames, the admirers of this particular fly are entitled to the benefit of the fact. But I confess that I am not myself a believer in white flies for night-fishing. Both on theory and from experience, I am rather inclined to think that if Piscator is bent on deeds of darkness, the fly he employs

Black as his purpose, should the night resemble.

Certainly for anything short of actual night-fishing a white fly would be quite useless on the Thames. Those I have recommended are well suited to the evening fishing, which in the summer months—the only season during which I would recommend the fly—is generally the best, provided the weather be warm and still. On showery or windy days the afternoon will be found better for sport than the evening. Let me add that in the Thames, as in all English streams with which I am familiar, the hours between nine and twelve are nearly always suitable for fly-fishing. When the water is just tinged by a slight freshet the trout will be on the feed throughout the day. And the angler will always do well to cast frequent glances out of 'the tail of his eye' up and down the stream, and to enjoin similar vigilance on his boatman. If you see the quiet but deep 'break'

of a good Thames trout at feed on the fly within fair distance of your line of drift, the odds ought to be heavy on the rod against the fish, provided you do not lose nerve and bungle your cast through eagerness. Ten to one he will take your fly if you show it to him in good style, and the hooking him effectually is almost a matter of course if you are not in a hurry. Of all the trout that have risen to me in the Thames I can remember to have lost but two. One made a fair miss of my fly in the swirl of a hatch-hole, and I failed—perhaps through my own fault—to lure him again. The other—a very heavy fish—took me just at the stake-bound head of an eyot close above Harleyford, and I thought I had him safely fixed. But I was alone in a little sculling-punt, and could not prevent his getting a start of me down stream, an advantage which I always grudge to a good trout. The way he pulled and bored down stream was a caution to steam-tugs. I was bound to keep him in hand at all risks, or he would have run my line out without giving me a chance, and at last he fairly tore out the hold. With a handy friend at the sculls I have little doubt I should have saved him.

Fishing with the natural May fly has with many good anglers and on many well-known streams been a favourite method of killing large trout about the beginning of June. Personally, I have never cared for the use of the blow-line, or even for the more skilful and less tedious practice of casting the natural fly, by which a few exceptionally dexterous hands now and then succeed in filling their baskets when the Green Drake is 'on.' Still, had I heard of these methods being employed successfully against Thames trout, I should have felt myself bound to report accordingly. But though the May fly while steadily diminishing during a long series of years, yet appears in considerable numbers on many reaches of the Thames, I do not remember to have heard of a single fish taken anywhere with the natural fly. If such instances have occurred, they have certainly been very rare. The cause of this is doubtless to be

found in the width of the river, and the difficulty of getting at the likeliest runs from the bank.

There is one legend concerning the capture of a patriarchal trout at Henley Bridge in which the May fly plays a curious part. The fish in question is said to have had his haunt some yards below one of the arches, and to have been for several years so plied with baits of every kind that he became as thoroughly temptation-proof as St. Anthony himself. At length an inventive Londoner tried him with a live bleak, about two feet above which dangled a live May fly on a fine drop-link. The bleak, judiciously steered, was brought across the wary trout's field of vision, in apparent pursuit of the insect. Father Fario naturally assumed that this must be the genuine article, and straightway proceeded to make a mouthful of the bleak, which, unluckily for him, had not only a small guiding-hook in its nose, but also a triangle craftily hitched behind its back fin. I do not vouch for the truth of this legend, which has been more than once related to me, but never with the name of the artful dodger who devised the successful plot. An incredulous reader might certainly be justified in remarking that such a feat as this, if real, must have immortalised the performer and placed his name high among the worthies of the gentle craft. Let the objection stand for what it is worth. 'I tell the tale as 'twas told to me.' And it may serve to introduce the question of livebait-fishing for Thames trout. It is certainly not a sporting method, and demands a *minimum* of skill. It has not, like spinning or fly-fishing, the recommendation of active exercise, and there would be no great loss in abandoning, or forbidding it altogether. Yet we must allow for different circumstances and temperaments. There will always be anglers found—and those, perhaps, not among the least thoughtful and cultivated of the brotherhood—to whom fishing is not so much an outlet for bodily activity or for the power of ingenious contrivance, as a 'contemplative man's recreation ;' an occasion for peaceful meditation and well-earned repose. Those who thus regard

the exercise of their art may well be content to lie on a sultry summer's day anchored above or beside the rush of the 'lasher,' while the live minnow to which they look for the chance of a lusty fish wavers and flashes forty yards below, among the eddies of the widening stream. He has merely to set his rod at a proper angle, and then to take his ease, 'as humours shall determine.' He will seldom fail to court the soothing influence of pipe or cigar, while he refreshes his memory with reading some favourite poem, play, or 'tale of romance.' Or perchance he may feel the mere effort of reading out of harmony with the sense of restful enjoyment to which he would fain surrender himself, and be content to listen to the gushing waters and whispering trees, till 'Beauty, born of murmuring sound,' seems to diffuse itself over the scene on which he looks dreamily through the half-shut eye. Such a mood may be rare with active men, yet there are few to whom it is wholly unknown, and it furnishes the best excuse for a mode of angling which can hardly be described as 'sport.' I must confess to having myself, on two or three different occasions, tried it for a short time on a very hot day, but though the lounge was pleasant, the capture of a fish by such means

Gave me some sensations like a villain.

To those who have no such misgivings, I will merely commend a bright, full-sized minnow, as the best live-bait. A small gudgeon is hardly showy enough, and if you try a bleak, you had better 'go the entire animal,' with spinning hooks in the rush at the stream-head. A single small hook through the upper lip of your bait may suffice, but I would rather advise the addition of a tiny triangle, with the tip of one hook just inserted behind the gristle of the back-fin. It is more certain to take hold, and secures you, moreover, against the rascality of some wary old chub, who without it, is very apt to bite your minnow clean in half, and go off unscathed. By the way, what remarkable strength must lie in the unarmed jaw of a large chub! His teeth are in his throat, and yet the cutting

power of his bite exceeds that of trout, perch, or even pike. You occasionally take him in paternoster fishing, but far more often you feel one slight pull, and find that he has left you only half a minnow, having secured his morsel by a single, well-directed snap.

But to continue my subject. There is little to add as to live-baiting for trout. Your gut should be as fine as is consistent with reasonable strength, and you will do well to have a single pellet of No. 4 or No. 5 shot, some four feet above your bait, just to steady your trace in the water.

There is another lure, akin in different ways to the fly and the live-bait, which, skilfully used, will be found very deadly on summer evenings. The fly-minnow can be worked over-hand at long casts, and thrown almost to an inch, and if it falls somewhat more heavily than the artificial fly, the slight 'spang' with which it drops on the stream, rather increases its attraction for a trout lying in any but the smoothest water. I would not recommend fishing a reach steadily with it, as you might do with the fly; but if you see a rush made to the surface after a bleak or other small fish, and can judge the position of your trout's haunt,¹ within a yard or two, you may cast over him with every chance of success. I have used this lure but rarely, though having good reason to believe in its efficacy, but an angling friend of mine who lived on the river between Bray and Maidenhead, and who fished almost daily during the trouting season, had remarkable sport with it. He assured me that in one year he had killed upwards of thirty trout with the fly-minnow alone. This however was before the wholesale netting of that beautiful stretch by Captain J—— and his gang, from the effects of which it has not recovered to this day, though I am assured that it is steadily improving. The depredators proceeded in the most systematic and wholesale manner, first dragging the numerous tenter-hooked stakes by which several miles of the very best part of the river were

¹ 'Holt' is the word used in the North and West of England; a slight corruption, no doubt, of the word 'hold.'

effectually protected, and then dragging the water night after night, till the choicest streams were depopulated, and hardly a trout left except in the weir-pools. Their *modus operandi* in pulling up the stakes, the exact position of which they had first ascertained by day-light, was simple but thorough. Drifting down the stream with a heavy punt, they dropped a slip-noose of strong rope over each stake, and then, by weight and strength combined, heaved it out of the river-bed. The knowledge of these tactics proved very serviceable when I was subsequently engaged in a very successful association for preserving the Thames about Marlow. In staking the ballast-holes and other places where the poacher's net was most to be feared, we took good care to drive our stakes very deep, to taper them towards the top, to fix no tenter-hooks in their sides, and in every way to make the task of drawing them difficult and troublesome.

To resume my story, however. I believe the fly-minnow, to the killing power of which I have borne witness, might have been greatly improved. It was slightly above the natural size, very light, with fins and tail of some transparent horny material. Its colouring was very much that which Walton assigns to the artificial minnow, wrought in silks by his lady friend with the 'fine hand;' that is, it was a fair imitation of that of the real fish as far as dead can imitate live colour. Its great fault in my eyes was that it was not bright enough. I would fain have had the dark shading of the back greatly reduced, and four-fifths of the surface overlaid with the brightest silver; the leaf to be renewed from time to time as the lustre tarnished, which might be easily done with the aid of a little gilder's size. Its dimensions I would have reduced to those of an ordinary minnow. I would have further increased its brilliancy when played in the water by a tiny swivel, which might be placed either at the head or at the end of the link of gut on which it was dressed.

I am by no means sure that a minnow not half the size of those I have used—say, an inch and quarter in length—made to fall as light as a salmon fly and silver-bright all over—might not do execution. I see a lure much used now, which calls

itself a fly, with a long silver body and two superfluous wings of peacock's herl, which is doubtless taken for a tiny fish. I would not use it myself in a stream where I was limited to the artificial fly, but I have no doubt it will kill in ordinary waters, though scarcely showy enough for the Thames. Something midway between this and the full sized fly-minnow ought, I think, to succeed.

Si quid novisti rectius istis,
Candidus imperti ; si non, his utere mecum.

There remains for mention only one bait with which Thames trout are too often taken. Briefly, if you bait a good barbel-hole—especially one adjoining a hollow bank—you are very likely to kill a good trout with the worm designed for the humbler fish. It can't be helped, though it seems a great pity ; but I certainly will not make the case worse by suggesting any other deadlier plan for using the base lobworm against a fish so much honoured and prized as the trout of Father Thames. He is not, let me observe, valued merely for his size and rarity. He is an admirable fish for the table ; not the very best of trout, but among the best. I know two or three cold lakes where the trout are redder in flesh and richer in flavour ; but a Thames fish of three or four pounds is as highly coloured as a grilse of the same size, and I think better tasted, and his diet is so ample that he improves with his growth. If you are about to take one home for your dinner, as soon as he is out of the well and knocked on the head, crimp him, judicious *gourmet*, scoring him to the very bone with a sharp knife. Let your cook in preparing him for the kettle wipe him out most carefully after 'gralloching,' but let the first water which visits his interior be that in which he is cooked, and see that it boils briskly to receive him and has a good handful of salt in it. Thus simply cooked he is worthy of the stateliest table. If you prefer not to boil him whole, let him be cut through the backbone into slices about an inch and a quarter in thickness ; boil rapidly and serve up with caper sauce as for salmon cutlets. A small fish split through and well broiled makes a capital breakfast. If you want

to send one as a present—and I think most anglers get more enjoyment from their captures this way than in any other—you will of course not crimp him. You will even hardly like to spoil his beauty by ‘gralloching’ him, though doubtless he will travel better for the process ; but you may at least fill his mouth with salt directly he is killed, which will go a long way towards keeping him fresh. I have never sent one which did not arrive in good condition. This, however, has no doubt been chiefly due to the superior firmness of the fish.

Having paid this tribute to the quality of Thames trout, I must say a few parting words as to their quantity. So much has been done and is still doing to maintain and augment the stock, and so many experienced anglers are enrolled in the different associations engaged in this work, that I shall venture on very little in the way of suggestion. There are, however, two points to which I would especially call the attention of those who are bent on increasing the supply of Thames trout. The first concerns the size of the fish to be turned in as stock in aid of the numbers actually bred in the river. I am convinced that much money and trouble has been wasted on the introduction of mere fry, having perhaps two years to scuttle for their lives before they become valuable either for breeding or basketing. Of course, I recognise the greater difficulty and expense of stocking with sizeable fish. We are, however, daily becoming more familiar with the conditions of fish transport ; while as regards the question of cost a better result will be obtained by doing a little in the right way than by attempting much in the wrong. No trout under three-quarters of a pound is in my opinion worth turning into the Thames. The best time for introducing fresh stock seems to be early in September, when pike are quitting the weedy runs and drawing towards the deeps, while trout naturally make for the bright shallows which form their breeding-ground.

The other point which I commend to lovers of the Thames is the importance of preserving its *smaller* tributaries. Streams like the Kennet, Colne and Wandle are preserved on their own

account, and are able to maintain their own progeny. But I **am convinced** from observation that the trout of small brooks, **such as e.g.** Bisham Brook, which joins the Thames near **Marlow Point**; the nameless runnel which feeds New Loch **pool above** Harleyford, and the beautiful little trout-beck from **Hambleton** which flows in at Mill End—often grow too large **for their quarters** in summer, and drop back to the fuller waters **and larger dietary** of the Thames. In any case, such brooks **furnish a ready supply** of fish for turning out; and the most **sanguine of** preservers will hardly expect to see the grand old **river over-stocked** with trout.

H. R. FRANCIS.

SALMON AND TROUT CULTURE.

THE attention of Pisciculturists is at present almost wholly devoted to the propagation of the salmonidæ, and justly so, as this family of fresh-water fish is not only by far the most valuable in the market, but is, *par excellence*, the greatest favourite among sportsmen in all countries where it exists. It has unfortunately the peculiarity of yielding fewer eggs than any other fresh-water fish, and consequently with the increasing demand artificial breeding has become a necessity, unless the race is to be allowed to dwindle, if not die out.

The following table of the number of eggs produced by several of the most familiar fresh-water fish is instructive :

Salmonidæ	.	.	.	about	1,000 to the pound
Pike .	.	.	.	"	10,000 "
Perch .	.	.	.	"	40,000 "
Roach .	.	.	.	"	640,000 "

It is with salmonidæ that the most excellent results have been attained by artificial breeding : yet it appears that in America, notwithstanding the enormous numbers of *Salmo Salar* (Salmon proper) that have been hatched and turned into the rivers of late years, expectations have not been realised in many instances. In the case of the migratory species we have to contend with ocean depths and innumerable enemies beyond our reach, which may possibly account for

heavy losses. The process of hatching and rearing young *S. Salar* is precisely the same as in the case of non-migratory varieties, only we keep these latter nearer home as it were, and consequently can protect them more effectually.

The proof of the great value of salmon and trout waters is the eagerness with which anything like a 'good stretch' is taken up. To say nothing of the rental per annum of 500 yards of salmon river which recoups itself to a great extent by the sale of fish for the market, a very large sum is ungrudgingly paid for a decent piece of trout-fishing, or a rod on Club waters.

Many of our streams and ponds are capable, with judicious management, of holding far more fish than they now do, but the water must be carefully protected, and the stock of fish kept up by breeding artificially. There are many Angling Societies and proprietors of private fisheries who make a point of replenishing their stock every year by purchasing from piscicultural establishments, or by carrying on artificial breeding on their own account. Most fishing-clubs, however, are at a disadvantage in not being able to provide suitable rearing places for their young fish, and they have to turn the 'Fry' that they purchase or breed direct into the rivers, which already contain trout, the probable consequence being that 99 out of every 100 go down the throats of the larger fish! Professional trout breeders have, of course, their rearing ponds from which they supply yearling fish, and although these are much more expensive than fry, there is at least the satisfaction of knowing that almost every fish will attain to a killable size if protected. It is far more economical for Angling Societies and Fishing Clubs to purchase yearling fish than to erect hatching establishments of their own, as there is not only the original outlay, with interest thereon, to be considered, but also a weekly expense in wages to one or more persons all through the hatching season, with in many cases a very unsatisfactory show of fish. A few hundred yearling fish would cost far less, and make a much better 'show' in the water.

THE HATCHERY.

Livingston Stone, in his excellent work, 'Domesticated Trout,' observes 'that the time has come when trout can be hatched, reared, and brought to maturity in great numbers, and with comparatively little loss. . . . The peculiar nature of the things you deal with, however, namely, fish and running water—and the magnitude of the numbers you operate with, are such that there is hardly an occupation in the world where a want of security is followed by such wholesale loss.'

The word 'security' in trout raising implies a great deal more than most people imagine. It means not only that all joints and screens in the hatchery and in the ponds are perfect, but that the supply of water must be 'secure' against falling short, secure against violent and excessive flushings, against becoming fouled, heated, or frozen; and all this requires an amount of foresight and tenacity of purpose, constant vigilance and caution, that very few men will undertake to exercise and persevere in throughout the whole season, and year after year; but this makes all the difference between successful and unsuccessful trout-breeding.

Security does not cease to be a *sine quâ non* as soon as the hatching season is over; during the whole of a trout's lifetime it has to be protected from innumerable enemies, and secured in many ways, to be of any ultimate value to the original owner.

In the limited space at my disposal I cannot, of course, enter into every little detail, and explain all the different sources of danger incidental to trout-breeding. A volume could easily be filled in treating of every separate stage in the life of a fish; therefore a good deal of condensation is unavoidable.

Assuming, then, that the supply of water for hatching purposes is of a suitable temperature, ample, fairly pure, and free from much sediment, it now remains to consider the

hatching apparatus itself. Storage tanks or reservoirs will still be necessary in most cases, as the water should not be taken from a very great pressure. Fish are as frequently killed by water that is too highly charged with air as from a scarcity of water.

It is perfectly possible to hatch a limited number of eggs in a few oyster shells, a soup plate, or a frying-pan—I was almost saying an old hat—by which I would convey that the material of which hatching troughs are constructed is not of so much importance as the *treatment* of the ova placed in them. The most important thing is the water-supply ; if this deposits much sediment, filters must be used.

There are different opinions as to the structure of hatching troughs. Whilst some prefer the 'glass grille' system, others find slate or metal troughs, wire gauze, or perforated zinc trays answer equally well. The glass grille system appears to me extravagant only as far as space is concerned. Lord Lauderdale says that in his water this system produces stronger fish. The first cost of the glass is certainly greater, but it entails no annual expense, and has the advantage of being an almost perfect non-conductor of heat or electricity, the latter being an important factor in hatching, and as yet insufficiently studied. With the water I employ, perfectly healthy young fish are produced by the other methods.

The 'slate trough' plan also loses much space, as it is not advisable to place the ova in more than one *layer* during the period of incubation.

The perforated tray system, with the 'underflow' supply, will bring on very many more eggs in the same area. To make a comparison—upon a superficial area of one inch, twenty to twenty-five ordinary sized trout ova will lie ; therefore to hatch, say ten millions of eggs on grilles, or on the bottom of troughs, an area of over 300 square yards is required (in reality 500 square yards would be necessary). In the perforated tray system, eggs may safely be placed ten or fifteen deep ; the space required to bring on ten millions of ova by this method would thus be but a tenth or a fifteenth part ; but as there is

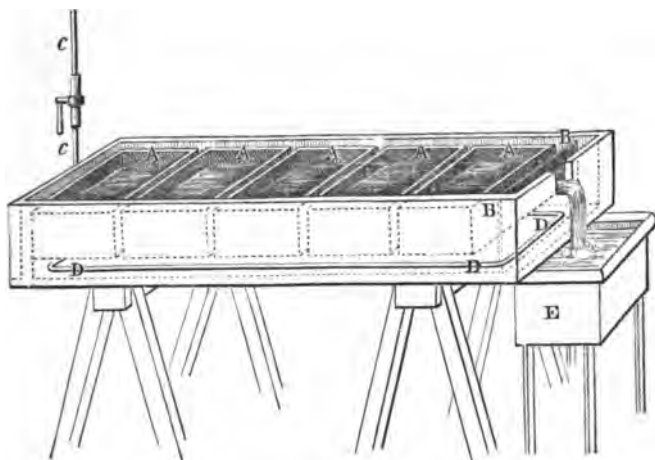
sometimes an interval of as much as three months between the first and last ova obtained, a second crop is laid down, and the boxes or troughs are used over again.

The troughs now in general use in my hatchery are made of wood. They are three feet long, by one foot wide, and six inches deep, and supplied with water through a punctured pipe running all round the trough. They are fitted with movable perforated zinc trays twelve inches (bare) by six inches wide and three inches deep. This plan, although not entirely a novelty, appears to have suggested itself some years ago both to myself and to Mr. Oldham Chambers, whose practical experience in fish culture generally is well known. It seems to have originated in my very old plan of using perforated zinc trays, into which were counted the 'Fry' previous to sending away. The ova it was imagined were placed in these trays, which were put on the bottom of the overflow trough, but of course the eggs perished as the water did not circulate. It was then thought that such trays would answer for hatching ova if raised from the bottom of the trough, and the water made to circulate by an upward current. This plan, though not claimed as an invention, can hardly be called a modification of any other, although it bears some resemblance to several which have been used in America. It has certainly found favour among pisciculturists on account of its great economy in the items of prime cost and of space. One of these troughs costs about 55s. complete, and will bring on over 100,000 eggs, whilst a set of six slate troughs costs between 8*l.* and 9*l.* and will not contain more than half the number of ova. The trays may be much larger, but I prefer this size on account of their handiness and comparatively slight weight. Instead of 'carbonising' the wooden troughs, I have them coated, as well as the zinc trays, with tar varnish. Silicate paint answers as well.

Livingston Stone, in the book before referred to, says, 'One form or the other of the tray system is undoubtedly destined to entirely supersede the old methods of hatching on glass grilles or on the bottom of troughs.'

Economy in space, where operations are conducted on a large scale, is unquestionably a great advantage : but it is not only in space that the saving is effected : there is a saving also in the cost of building and fitting up the hatching-house, as well as in the quantity of water required—the last an important item of expenditure in many hatcheries.

Whatever be the fashion or materials of the hatching



SKETCH OF WOODEN HATCHING TROUGH.

3 feet long by 12 inches wide and 5 inches deep.

troughs, they should be placed in a good light, and arranged so that they can be easily manipulated for removing the fish and cleansing. Some hatching troughs are placed in out-of-the-way dark corners, where there is no possibility of seeing what is going on, and a great deal of mischief is done before the cause is found out. The cut represents the hatching troughs in my hatchery.

As before stated, the whole of the inside of the troughs and the perforated trays should be coated with tar varnish or paint,

or the wood-work only may be 'charred.' Varnish or paint, however, preserves the zinc, and prevents oxidation. The punctured pipe must be raised a quarter of an inch from the bottom, by means of little feet soldered on, as in case any fish escape from the trays in manipulation, they would be killed by attempting to get under the pipe if it is laid on the bottom. It is often necessary to *thin out* the young fish, and the bottom of the troughs thus gives a large amount of extra space, and the fish can be drawn off by the waste pipe when required.

One looks back with much interest to the time when these experimental operations were commenced. How well I remember my first day's trout spawning; how careful I was that the can containing the freshly taken ova should not be shaken on the journey of three miles home: the least jostling or swinging of the can sent a feeling of horror through me; and what an excited state of uncertainty I was in for the first few weeks, wondering whether with all the clumsiness in taking the eggs, any of them would 'hatch out.' I have since learned that freshly taken ova can be sent long distances by rail without danger, and I prefer to send them in water rather than moss, as they can be transferred to the hatching troughs more quickly, and with less risk of concussion. The ova will not bear the same amount of shaking and disturbance forty-eight hours afterwards, but they may be examined with a glass tube, and carefully replaced in the troughs without injury, from the day of taking: anything approaching concussion, however, kills them, until the tissues of the fish are firm and their eyes are visible.

THE COLLECTION OF OVA.

When everything in the hatching-house has been tested, and ascertained to be thoroughly sound and in order, the ova is to be procured. 'First catch your hare,' is applicable here. I remember in former years the great uncertainty and risk there

was in depending on rivers for the stock of ova. Some of the best parts of the Test, Itchin, Wey and Kennett were at my disposal ; but seasons vary in our fickle climate, and I have found more than once that the fish had already spawned, and gone down to the deeper water, or that they would not be ready for a week or more. This meant, perhaps, no eggs at all from that river, or another journey. Then, if a second attempt was made, heavy rain has often done mischief, and nets would not work the river. Trout will sometimes defy the best net in the world, as, in close proximity to the spawning ground there is frequently 'a sweet little hiding place,' seven to ten feet deep, running far under the bank, and full of stumps and roots, into which the fish instantly fly ; get them out if you can ! The execution of the strategical movement is doubtless sagacious as well as instinctive on the part of the fish, but it shows a disinclination to a closer acquaintance which is not satisfactory to the would-be operator, who returns home egg-less, and not unfrequently wet to the skin.

My plan has been to secure, by lease or purchase, ponds already in existence, and to construct others, where I may with certainty rely on finding breeding fish when they are wanted. If a few of the female fish are not ripe on the first visit, they are removed to a smaller pond for a few days : by these means I get all the eggs which my fish produce. The ponds are netted, and when necessary drawn off. If care is taken no fish need be lost or killed by running ponds off, and it is a good plan to draw the water off occasionally, in order to get rid of any loose mud which may have accumulated. A 'goodly sprinkle' of eggs has been obtained from the before-mentioned rivers almost every season, and the quality of Test, Itchin, Wey, and Kennett trout is so well known that it is needless to say anything here in their praise.

I believe, however, that the future quality of the fish depends rather on the food they get, than on the water from which their parents come. The character of a trout alters very much under changed conditions. Still it is advisable

to get ova from good 'strains' of fish, and from large, healthy breeders. If they come from a degenerate breed it is not probable that the offspring will be healthy, nor grow to any great size. Trout brought from Scotch burns, or little Welsh and Devonshire streams will often grow to a large size in more suitable water, although they would never have got beyond half-a-pound at the most in their native stream. There is a decided advantage in having large ova, for the simple reason that the fish hatched from them are bigger, and able to take much larger morsels of food; they thus get a good start of their smaller brethren, and, as a rule, keep it. I have found that the largest and best eggs are produced by fish from three to five years old. The size of trout ova varies very much, as the following comparative table will show.

Sample No. 1	S. Fario . . .	measures	20 inch or $\frac{3}{16}$ nearly
" 2	S. Fontinalis . . .	"	23 inch or $\frac{7}{32}$ nearly
" 3	S. Levenensis . . .	"	24 inch or $\frac{1}{4}$ nearly
" 4	S. Fario . . .	"	26 inch or $\frac{1}{4}$ full
" 5	S. Ferox . . .	"	26 inch or $\frac{1}{4}$ full
" 6	S. Fario . . .	"	30 inch or $\frac{5}{16}$ nearly

These measurements are the largest diameters, the eggs not being perfectly round.

Where fish culture is practised on a large scale, hundreds of thousands, or even millions of eggs are required. At several of my ponds I can safely reckon on 100,000 to 400,000 in a day's spawning. I am under obligations also to several friends, who allow me to take what ova I can get from their water, and I endeavour to make them some return by sending them fry or yearling fish.

IMPREGNATION OF THE OVA.

The first principle of modern pisciculture is the fecundation of the ova by artificial means. 'In consequence,' observes Livingston Stone, 'of the discovery that all mature eggs are

impregnated by coming in contact with ripe milt, the fish, both male and female, being taken at random, we are compelled to admit, however unwillingly, that the origin of fish life, in artificial impregnation at least, is wholly a mechanical affair.'

Unless, however, a very large percentage of fertilised ova is shown, and unless these are taken from strong, healthy parent fish, the pisciculturist's labours are incessant and irksome, as he will have to be constantly removing 'blind' or unimpregnated eggs, and weakly 'fry'; whereas, if his breeders are healthy, and his eggs properly taken, he may reasonably reckon on a large proportion of strong, healthy fry, which will in due course, and with proper treatment, develop into valuable yearling fish.

The discovery of the 'dry method' of impregnation, by M. Vrasski, a Russian, about the year 1856, is of the greatest practical importance. It was not, however, until some years after, that it became generally known in America, and still later in this country.

Stone (p. 105) says: 'No one hereafter, who has heard of the new method, will ever take the eggs of any cold water fish by the old method. Seth Green reached the same results nearly ten years before, by using a *very* small amount of water in the impregnating pan;' and Frank Buckland ('Familiar History of British Fishes,' p. 303) found that by placing milt in water first, and then adding the eggs, he obtained better results. In this case, I presume that the eggs were added within a *few seconds* after the milt had been placed in water.

By the 'dry method,' nearly one hundred per cent. of the ova taken can be fertilised; whilst by the old plan of placing both the ova and milt in water, the average scarcely ever reached higher than fifty or sixty per cent. There was always risk, by the old method, that the absorbing power of the egg had ceased before the milt was added, or that the vitality of the milt had disappeared when several minutes elapsed before

the two were brought into contact.¹ It is well known now that the ova will retain the power of absorption of the milt for a considerable time, if *water* has not already entered the 'micropyle;' but if water enters first, the spermatozoa does not take effect. It is also known that 'milt' will not live long in water—two minutes being the supposed limit. 'Paradoxical as it appears, water drowns them' (Stone, p. 107). It is stated that the 'Spermatozoa of the milt remains alive *several days* when kept from the air and water,' consequently crosses of breed can be effected which should lead to valuable results. The introduction of 'fresh blood' by these means would be very simple, and of the greatest advantage to waters where the fish have become degenerated; it would, however, take at least five or six years for the improvement to be seen, but the time might be shortened by the introduction of yearling fish from other waters.

Both the eggs and the milt are now put into a spawning pan with *no water* save that which falls from the body of the fish in the process of taking the eggs, and the results are in the highest degree satisfactory. Water is of course added after a few minutes, and the usual rinsing is necessary. I have frequently had samples of eggs in which 100 per cent. have been impregnated, and many other pisciculturists have similar experiences. A table is given in Stone's book (p. 104) of thirteen samples of eggs, amounting in all to 72,300, in which 96 per cent. were impregnated, and on the next page he very naturally considers the difference in the labour which this makes, calculating that in a million ova it would take about thirty-five whole days to pick out, one by one, the worthless 40 per cent. which are found by taking the eggs on the old system. The bad eggs *must* be removed sooner or later, and it will be immediately seen that the work of a pisciculturist is very much lessened when he has 95 per cent. of good eggs, and but 5 per cent. remain to be picked out.

¹ On the day the above was penned the writer operated on 350 fish in two hours; this, without allowing for pauses, gives twenty seconds for each fish, and is tolerably quick work.

TREATMENT OF THE OVA.

As soon as impregnation takes place, the micropyle closes, and water cannot enter except through violent concussion. When the 'germ' has risen, and 'segmentation' begins, the ova should be disturbed as little as possible. After this, if the hatchery is well regulated, nothing short of violence or absolute neglect can prevent the regular progress of nature, and the eggs will, in due time, hatch.

The period of 'incubation,' as it is sometimes called, extends over fifty to seventy days in water of 46° to 50° Fahrenheit, and during this period the pisciculturist's labours are not very excessive, provided he has everything in first rate order, and a good percentage of fertilised eggs. The time occupied in picking out white (that is dead) ova, and any foreign substance which may appear, is inconsiderable, and it is not necessary that this should be done every day ; three or four times a week is often enough, unless the temperature rises, in which case 'fungus' and 'byssus' grow more rapidly.

A number of good eggs are sometimes spoilt by the incessant disturbance caused in hunting after a few bad ones, and awkwardness in removing them. Personally I allow no one to touch my ova until they have been in the water twenty days, undertaking all the picking over myself during that time. A few minutes at the different troughs is all that is required.

If ova are sent to the Antipodes, they should be packed and placed on board ship as soon as possible after they are taken from the parent fish. The voyage is too long if packing is delayed until the eyes appear ; and as the temperature in Australia and New Zealand is at its highest in December and January, it is advisable to send eggs of late spawners, so that they arrive there at a cooler season, viz. April or May.

The first consignments of ova which arrived in New Zealand were probably those packed by Mr. Youl and Frank Buckland in 1864 and 1873, and were collected from the

head waters of the River Wey, at Alton. These fish run up to eight and ten pounds and occasionally even larger, and are perhaps amongst the finest class of trout to be found in the country. With the refrigerator plan now general in steamships, there is no necessity for carrying ice, as it is manufactured on the voyage ; but I am not so sanguine of success if the packages are placed in the refrigerating-room, as should the temperature remain too low for any length of time the eggs would perish. If the packages are placed in a cool chamber, and covered with ice sufficient to last the whole voyage, the process of incubation can be sufficiently retarded to prevent the ova hatching out. The 'snow' which accumulates in the shafts of the machinery during the voyage might be utilised by arrangement with the person in charge of the refrigerator : there should be an arrangement for carrying off the melted ice or snow, or probably it would become a source of danger by flooding the packages.¹

In about forty days from the time the eggs were taken, the embryo is distinctly visible through the outer shell, and the ova can be handled almost with impunity. This is the time to send them any distance not exceeding fifteen or twenty days' journey. It is also the best time for the fish-breeder to ascertain what is his percentage of fertilised eggs, as disturbance is no longer injurious. The whole tray full may be removed to a pan, and thoroughly washed, with the effect of setting any unimpregnated eggs turning opaque white in a few minutes, and leaving the good eggs perfectly clean and free from sediment.

Unimpregnated ova will sometimes remain unchanged in colour for many weeks, but a disturbance such as that just suggested will usually find out the worthless ones ; at all events, the smallest examination will show that in the good ova the eyes are strongly developed, and the bad ones have but a small

¹ This, and the small number of impregnated eggs, appear to have been the cause of failure in the last attempt in January 1884. The writer is on the point of packing some ova for Australia, and will endeavour to profit by past experience. Whether there is any water suitable in Australia, is another matter altogether.

annular disk at the top. These should now be removed, as they never develope, and occupy room required for others which in a short time will.

I have heard of ova having been ninety days in the water without showing the eyes, and without turning white ; of course the tyro was wasting his time, hoping against hope, and at last had to throw all the eggs away. If ova, after being fifty days in water of exceedingly low temperature, do not show, even to a novice, unmistakable signs of becoming young fish, *they never will*, and may be got rid of at once ; they will make a meal for some large fish which may be handy to the hatchery.

The eggs can now be packed in moss, and sent long distances. During the last few years eggs have been conveyed across the Atlantic, with the very smallest loss. My last consignments of *S. Fontinalis* from America have arrived in first rate condition, not more than five per cent. being spoilt, and these evidently had been bruised in packing.

The plan of packing does not vary much with trout-breeders. The eggs are placed in alternate layers between moss, and protected with a covering of mosquito netting, muslin, swan's down calico, or butter-cloth, so arranged that the eggs shall not be crushed or escape. These layers are first placed in boxes about a foot square, and afterwards in an outer wooden case, well surrounded with saw-dust, and placed in the ice-house of the ship. Previously to the last condition, boxes of ova were probably put among the general cargo, and there was risk of their becoming heated on the voyage. For many years it was a matter of the greatest uncertainty whether the ova of *S. Fontinalis* (American) would reach England in good condition. Many hundreds of pounds sterling have been wasted in this way, I myself having received several packages of 30,000, 50,000, and 75,000 in a perfectly putrid state ; but being convinced that the loss arose from heating on board ship, I took some little pains in making arrangements with the shipping companies, who readily agreed to do anything in their power to facilitate the transport. The 'Inman' and 'Cunard' com-

panies have been most obliging in allowing certain other privileges which have gone far to insure successful transport, and from that time the ova which I have received from America, as well as those which I have exported, have arrived in excellent condition.

There are three causes of failure in exporting ova, viz. imperfect fecundation, bad packing, and heating on the voyage.

The distribution of ova within the limits of Great Britain and Ireland, or indeed all over Europe, is a very simple matter, and is done on a large scale by leading pisciculturists. For a journey of several days it is sometimes necessary to place some rough ice in the package to keep the temperature down. If they are to be many days on the journey, they should be sent off as soon as the outline of the fish and the eyes are distinctly visible ; this leaves a margin of fifteen to twenty days, according to the temperature of the water into which they are afterwards placed, before the hatching period arrives.

When the eggs are all 'eyed,' the pisciculturist has but to remove any sediment settling on the ova, and to pick out occasionally a dead one. In the best water available for hatching purposes, there is always a *slight* sediment after it has run through the troughs five or six weeks, but this can be got rid of by removing the ova from the troughs, and washing them—in the tray system, by lifting the trays up an inch or two, say half-a-dozen times, and replacing them, or in the glass grille system, by sprinkling clean water over the eggs from a watering-pot. A hatching-house should be fitted with a 'sink' five or six feet long, where any washing can be done.

Nature will now do the rest of the work in good time, and with very little help on our part. The greatest assistance we offer nature is in the protection of the ova and newly-hatched fish from every natural enemy during the most helpless part of its existence ; the only part of fish-hatching which is purely artificial is the taking of the eggs from the parent fish.

As soon as the great 'hatch' comes on, there is more work for the pisciculturist in removing the empty egg-shells from the

hatching troughs, as the little fences which are effectual to keep the young fish in the troughs will also prevent the empty shells from floating away ; but this is the work of a few minutes only every day. Either the whole tray full of hatching fish may be turned out into a pan, and the empty shells poured off, or the greater part of the shells can be skimmed off with a cup or small muslin net ; whichever plan is adopted, it should be repeated until all the fish are hatched, and the troughs are perfectly clean. A few fish may have to be assisted out of their shells by the use of a camel's hair pencil, as they sometimes hatch out *tail* instead of *head* first, and the struggles of the young fish to get free sometimes end in their being strangled.

A small percentage of the fish always die in hatching, and must be speedily removed. Deformities and monstrosities are occasionally met with : some have two heads and one body (Salmonese Twins !) ; others have one head and a body and a half ; a few also are hatched with three heads ; a few with four eyes, and some with no eyes at all.¹ These are placed in a spare corner for observation, or preserved in spirits—they never live more than five or six weeks.

There will soon be left a wriggling mass of veritable young trout, huddling together into every corner of the trough out of the light. There is no danger in this, unless the troughs are *over-crowded* with fish. In this case comes 'gill fever,' or inflammation of the gills, a plague with which I am happy to say I have never been troubled. The effect of inflammation of the gills is to eat away a portion of the gill coverings, and if the fish survive, there is always trace of it to be seen in after-life,—nor do they ever thrive or have so good an appearance.

A pisciculturist having anything like a demand for his ova will, ere this, be able to *thin out* his stock considerably by finding unoccupied troughs ; at this time also the perforated tray system seems to offer the greatest advantages, as the fish can be prevented from over-crowding by being kept in separate

¹ Two specimens, with three heads, have been found in the writer's hatchery during the last eighteen years—curiously enough these were both 'Americans.'

compartments of the same trough, and counted out in batches of one or more thousands, ready to send away at the right time, and at a moment's notice.

Nature has provided the young fish with the 'umbilical sac,' which supports them for about six weeks : this gradually becomes smaller, until it is finally absorbed into the system.

The newly-hatched fish is a perfect marvel of construction, and can be seen to perfection in a drop of water under a microscope at a low power. Every organ is shown distinctly; the colouring of the skin and the circulation of the blood through the whole system is plainly visible. Buckland writes, 'The foot of a frog is pretty enough, but is no more to be compared to the young fish than a schoolboy's daub to one of Sir Edwin Landseer's pictures.'

REARING OF THE FRY.

While the young fish are in the 'Alevin' stage, there is but little to be done in the hatchery ; almost all that is necessary is to keep the water constantly running in a slightly larger volume and to remove the few fish which may die. During this period I prepare for sending them away by removing them to a large shallow tank capable of containing fifty or sixty perforated zinc trays, each holding a thousand or two. Overcrowding is thus avoided, and the fish are at hand at a moment's notice. In about six weeks after hatching, the umbilical sac is completely absorbed, and the young fish require food.

L. Stone says concerning the rearing of Fry, 'Here, the triumphant skill which hatched the eggs successfully was baffled, and it seemed for a time as if the wonderful art which had promised so much was to come to a stand-still at this gulf between the eggs and the yearling trout, a gulf which seemed as if it could not be bridged. . . . The question is not now, "Can young trout be raised?" but "How many can do it, and under what circumstances can it be done successfully?"'

Feeding artificially in 'rearing boxes' is, in my opinion, an

expensive and unsatisfactory plan compared to the natural food system, and the time comes when the fish *must* be removed to more roomy quarters. Some pisciculturists, however, prefer to keep the young fish for a few weeks in the hatching or rearing boxes, believing that it gives them a better start in life. I do not agree with them, as I maintain that the small loss which *may* occur by turning the fish out in the open at once is more than compensated by the quicker growth they make on more natural and nourishing food.

Young fish will not, as a rule, take artificial (i.e. dead or manufactured) food after it has fallen to the bottom of the boxes: and there is soon an accumulation of decomposing matter, which is very injurious, and troublesome to remove without damaging the fry. Again, the water which is suitable for hatching purposes, on account of its purity and low temperature, is not suitable for rearing. It lacks the very qualities so essential to the future development of the fish. The hatching water is exactly that which is wanted to bring the fry *up to feeding point*; but from this time there is nothing in its composition to nourish young feeding fish, being altogether too *barren* so soon after coming from the springs and almost wholly excluded from light.

But it is not in every locality that the natural food can be found in sufficient quantities to 'keep the fish alive and growing,' and to bring them on to maturity; therefore artificial feeding is in some cases compulsory. If the fry can be carried through the first three months, many of the dangers to which they are subject cease. They can take larger food, and a greater variety; but the difficulty is to provide suitable food and lodging to rear them even to this age.

My plan is first to select water *which possesses the requisite properties for breeding the natural food*, and on it to construct nursery ponds of a convenient size: 'The great thing to encourage in your fishery is food which is reproductive.' This remark applies to trout water, and has special reference to the food in streams; but the fact of making a small stream into ponds does not alter the character of the water (except in most

cases to improve it), and if a number of ponds are constructed on different levels, these will preserve the food, if the volume of water passing through is sufficient, and yet at all times under perfect control. The raising of trout appears to be entirely a question of food, both in quality, size, and quantity; and unless this can be provided naturally, the rearing of any great number of fish is a most expensive undertaking, various kinds of meat or offal having to be procured, and a staff of assistants constantly employed in chopping or otherwise preparing the food. The system of feeding at the Howietown Fishery is almost wholly artificial, especially for the large fish, and this establishment (by far the largest in the world) turns out great numbers of yearling fish. There is but little natural food to be found in the water, but this has lately been introduced, and watercress cultivated in all the ponds. A pisciculturist, however, relying entirely on natural food must have larger ponds and more of them, involving a considerable original outlay. Without proper food, natural or artificial, the loss would be something difficult to realise—perhaps equal to that arising in the natural state, where it is thought to be probably not less than 999 per 1000!

If a small proportion of the young fry—turned direct into the ponds from the hatchery—die, they are devoured by fresh-water shrimps and other carnivorous insects, valuable in themselves as fishes' food, and also acting as Nature's scavengers of the water; but if proof is required that these do very little damage to healthy fry, the writer may mention that he has frequently found 80 and 85 per cent. of yearlings, which were placed in the ponds eleven months before as fry. Let anyone observe, however, the rapidity with which a dozen shrimps will demolish a *dead* 'fry.' They will cluster all round it, and in a very few moments there will be nothing left but his little backbone—the fish get the best of it in the long run though!

Seth Green, a well known American pisciculturist, says 'Starvation' is almost the only cause of mortality among fry provided they have been properly treated in the earlier stages. How many millions of fish have been deliberately (in some

cases unavoidably) *killed* by 'starvation' either before or after turning out, it would be impossible to calculate !

My own fish are sent off to the 'Nurseries' on the first signs of their requiring food, which they show by rising from the bottom of the hatching trays into about mid-water, balancing themselves there, with heads against the current, and turning at any small particle they see passing. It appears as if the first good meal a young trout gets may be compared to the 'Nest-egg' which a man is advised to put by—it is often the making of him !

Unlike most other very young animals, they seem suddenly to acquire the movements and habits of old fish, and to pass from the helpless 'alevin' stage into maturity in all except bulk.

Some interesting experiments have been tried in my garden, where there are several tanks twelve feet by six feet and seven inches deep. Last spring a few (150) grayling and trout fry were put into one of these tanks at the 'feeding stage.' The tanks are supplied with the hatchery water, *but exposed to light and air* ; every third or fourth day a can of weed, swarming with the larvæ of small water-flies, was sent up from the neighbouring nurseries, and up to the time of writing, when they are on an average four inches long, there has been scarcely any loss. The temperature of the water was eight degrees lower than that of the nurseries, and the larvæ did not live longer than four or five days ; so that fresh supplies had to be procured, but the fish have never had an atom of any other food.

The larvæ of water-flies and the mature flies themselves, as well as the *Gammari* (fresh-water shrimp) and *Limnæ* (snails), may be transferred to other waters of about the same temperature without difficulty ; and if a large quantity is introduced into suitable waters where there are no fish, sufficient food to rear a great many fry will soon accumulate by reproduction. Watercress is one of the best plants for trout ponds or streams ; watercress grows lime their beds to destroy insect life.

NATURAL FOOD.

The one great difference between my treatment of young fish and the plan adopted by some other pisciculturists lies in 'Feeding.' It must not be supposed that my fish are turned out into the ponds without any thought of how much food they may get ; on the contrary, it is by the most rigid preservation of the natural food that I am able to grow yearlings to the size and number I usually do. Every little water-course on my grounds is utilised as a means of producing large quantities of natural food, and any one who knows the immensely prolific nature of aquatic insects, will soon understand that I have no difficulty in providing sufficient food for the fish in all stages. Two or more ponds of a 'sequence' are set apart for the reproduction of food only, and as these are properly situated a great quantity can be sent down to the nursery ponds as often as necessary.

Stone (p. 225) says, 'Trout's food, when wild, consists chiefly of water-insects, smaller fish, larvæ, fish eggs, crustacea, and the flies and insects which fall from the air into the water ; all of them together forming an astonishingly extensive variety. The quality of their food affects the growth and appearance of trout, and it is even thought that the difference in the colour of their meat is sometimes caused by certain kinds of feed ; the fresh-water gammari, or pulex, being supposed especially favourable to the production of red-meated trout.' At p. 289 of F. Buckland's 'British Fishes,' he says, 'Some trout are white-fleshed, and some are pink-fleshed ; some say it is dependent on the food, but I think this cannot be the entire cause, for I have caught both pink and white in the same net, and both living exactly under the same circumstances. One theory of the cause of the flesh being red has lately been told me by the Duke of Argyll, who believes that red-fleshed trout have been feeding on the fresh-water shrimp, and that the horn-like coats of this little animal turn red in the stomach through the action of the gastric juices. Lord Dorchester also writes that "his best

fish when first taken throw up a species of fresh-water shrimp." Again, "where these gammari are most plentiful the trout are nearly always the largest, and of the best colour and condition."¹

It appears to me that there must be some colouring matter in the 'shrimp' itself, as they turn red, or rather, a deep orange colour, when dead, not having been in a fish's stomach. Trout, although apparently living under the same circumstances, feed very differently, and some may prefer one kind of food to another, doubtless caring very little whether his flesh is pink or white when his turn comes to be put on the table! F. Buckland, in his manual of Trout culture, advises the destruction of the 'shrimp' as 'vermin.' From this dictum I must beg to differ entirely, maintaining on the contrary that the fresh-water shrimp is the *finest natural food* to be found in the water. Doubtless they *do* destroy a few of the ova deposited naturally in the ponds or rivers, but not anything like the quantity which the parent fish and the later spawning fish devour, or spoil by the frequent disturbance of the spawning grounds: moreover, a pisciculturist takes care that his fish do not spawn in the ordinary pond or nursery. Even in waters which are not annually replenished by artificial breeding, the damage caused by shrimps cannot be compared with the great gain in respect of food by its preservation.²

A pisciculturist protects the ova by bringing them to the hatching house, where no shrimps or other 'vermin' can possibly come.

The eggs of the 'gammari' are exceedingly small, almost microscopic, and when hatched are exactly the proper sized mouthful for the fry, as also are the small Limnæ, whose shell is so delicate, that it is easily digested by young fish.

It is one of Nature's wise provisions that most water insects breed and develop at the very time when the fry begin to feed.

¹ *Practical Management of Fisheries*, p. 18.

² See account also of trout growth-rate, when fed on water-shrimps at Lord Eldon's, p. 167-8. H. C.-P.

The stomachs of very young trout have been opened, and found to contain quantities of shrimps, snails and larvæ, and also the fry of such coarse fish as may happen to be in the same water.¹

PONDS.

The construction and maintenance of rearing ponds are matters of careful study, and often require considerable engineering skill in obtaining levels, so as to lose no space and economise labour. It is also to be observed that whilst the quantity of water and its 'reliability' are matters of the first moment, it must also be of the quality and temperature suited to the growth of the best natural food, and of the weed upon which 'the food' lives, and further, that it is not subject to pollution or uncontrollable floods. My own ponds are constructed as close to *springs* as possible, in fact, at the springs themselves, that is to say, either over the springs, or within a few yards of them. Here they are safe from any risk of pollution or floods.

If under the above conditions the quantity and 'unfailingness' of the springs are established, there is scarcely any limit to the number of ponds that may be made, depending on the fall of the land, and the extent of the holding. If, on the contrary, the springs have been known to fail, even in the driest season, I should turn my back on the place, however tempting in other respects.

It is a popular error to suppose that trout will thrive only in streams; they often grow far more quickly in ponds. It is not the current they require, but a constant supply of good water, with *plenty of food*. The majority of streams, however small in their normal condition, are occasionally subject to floods, and cannot, on account of the great body of water then coming down, be effectually fenced.

¹ At the proper season, large numbers of small coarse fish can be procured, including pike, perch, gudgeon, roach, dace, chub, minnows, &c., and these make excellent food for young trout. The writer has frequently hatched the ova of these fish for the express purpose.

A grating fine enough to keep the young fish within bounds chokes up with rubbish in a few minutes, and is carried away bodily or the water is forced into another channel ; in either case the fish are liable to pass out of bounds, and they are virtually lost to the original owner. The safest plan to adopt in the construction of ponds is to excavate rather than to dam up ; it is very much more expensive, costing as a rule between eight-pence and a shilling per cubic yard ; but this is much more than balanced by the security against unsound heads of dammed-up ponds. If the soil is suitable, however, a thoroughly sound 'head' is easily made, the thickness of which must depend on the weight of water behind it ; but the head should in no case be less than eight or ten feet through, and it is sometimes necessary to make it as thick as thirty feet. The inside of pond-heads should shelve off towards the centre of the pond at a considerable angle, but as much depends on local circumstances, no hard and fast rule can be laid down. Campsheathing, or planking, is necessary in some places, and brick heads may have to be formed where space is limited, and where a perpendicular head is required. If ponds are well made in the first instance, there need be no danger of the head breaking away.

In making ponds, it is most desirable to have the 'outlets' very capacious, so as to take off any extra water in a very wet season. Ponds for business purposes should also be constructed within easy distance of a railway station, and where good fresh water can be obtained on the road and added at the last moment. The cost and risk of removing yearling and older fish are very much lessened in such a case. *Per contra*, very many fish are killed by the addition of unsuitable water on the journey, and except in well known localities, I never allow water to be added after the consignment has been sent off, preferring to send fewer fish in one vessel, or, which amounts to the same thing, a sufficient quantity of water to last out, and keep the fish alive ; it is the rarest thing for any of my fish to be lost on the road.

A fish-breeder, who looks for some return for the money laid out on his 'fishery,' must be able to put his hand on any

or all of his fish whenever he wants them, and this can only be done by constructing a number of ponds. These may be round, or square, or any other shape, according to circumstances, and not larger than an acre in extent, otherwise they are difficult to net, and take too much time in running out. I prefer myself ponds of a quarter to half an acre for the yearlings, as the water can be run off in a few hours, the pond fished, and the water shut back in a day. This extent of surface exposed to the sun and air encourages a greater vegetable and insect growth than does a long narrow pond, and it is less easily 'poached.'

An additional security is to have the keeper's house close to the water, and also to place obstructions, such as posts ornamented with tenter-hooks, in the ponds ; poachers cannot afford to run the risk of confiscation or loss of nets more than once.

All ponds, whether for business purposes or for sport, should be capable of being emptied at any time, and the greater number of a pisciculturist's ponds are of necessity drawn down every season in order to supply the demand for fish, and also to make certain that no fish remain in them. A few fish of half a pound amongst the fry will make all the difference in the number of yearlings found, as I know from bitter experience. One season a few yearlings were left behind in a nursery pond, and on the pond being fished the next season, these had nearly quadrupled their size, but at the expense of thousands of fry. Trout are cannibals, and will, unless provided with plenty of insect food, devour one another as long as there is any great difference in their size. This has been observed in the case of a few fish of only eight weeks old, which had been by accident put in a hatching trough amongst some fry of about five weeks old ; a comparative monster was seen with the tails of two younger fario sticking out of his mouth ; he was instantly captured, and when transferred to a basin in order to exhibit his amiable propensity, he disgorged one of his little cousins, half-digested, but the other disappeared down his throat ! This propensity doubtless increases with age.

I hold at the present time, devoted to the different varieties

of Salmonidæ, over forty ponds, about thirty of which are usually set apart for rearing yearling fish and for food-growing.

A number of ponds is necessary, as there are at least five favourite varieties of Salmonidæ, viz. *Salmo Fario* (English brook trout), *S. Fontinalis* (American do.), *S. Levenensis* (Loch Leven do.), *S. Ferox* (Great Lake do.), and *Thymallus Vulgaris* (Grayling); and there would be immense trouble in separating them if the different varieties were placed in the same pond. *Fontinalis* and grayling could be readily distinguished, but it is no slight work with fish so similar in appearance as *Fario*, *Levenensis*, and *Ferox*, when small, to guarantee that they are not mixed; it would be more simple if the fish were not so active, and the water not quite so chilly.

The ponds for the large breeding fish are constructed on a different 'water-shed,' or at all events on different levels from the rearing-ponds, and are so fenced that there is no possibility of the larger fish getting into the nurseries, or the small fish getting out. The area of the ponds for the breeding fish is much larger, and the water deeper. Ponds for sport only may be as large as possible, and the bigger the better, but in all cases they should be capable of being emptied, as there is sometimes the probability of pike or perch getting in, and these might have a real good time of it amongst the trout, before detection. A few very large trout will also do as much damage, amongst smaller fish, as pike, and if the water can be run off they should be removed or destroyed. Pike and perch are occasionally introduced into trout waters through the medium of water-fowl. I have found small perch in one set of my nursery ponds, which *must* have been conveyed by birds, in the ova stage, as there were no perch nearer than five miles, and these were in ponds on another water-shed.

The presence of pike in some of our best trout waters is the curse of the place, and it seems to be impossible to get rid of them, although a price is set on their heads. One reads of hundreds of pike having been killed during the season from some favourite trout-stream; but it seems probable that the

nuisance will continue so long as large ponds at the head or by the side of the river contain them. There is no keeping them back by fences, and frequently no attempt to do so ; the effect being, very often, that the best part of the river is occupied by pike, instead of containing a good stock of trout. Netting the ditches by the side of the river at spawning time is a good way of helping to exterminate these depredators.

ON STOCKING.

A pisciculturist is frequently asked which is the best kind of trout to stock a certain piece of water. The question cannot be decided without actual experiment, but a tolerably good inference may be drawn by comparison of the particular water with other in the same neighbourhood.

Yearling fish should be introduced when the stock in the water has become low ; it is generally a waste of valuable fish-life to turn 'fry' into a stream or lake which already contains some trout ; if there are small tributary streams on the same property leading into the main water, the stock may be replenished year by year with 'fry,' or even ova ; but as there would always be considerable loss, *very large numbers* must be introduced, and the tributaries must be well fenced (which is always a difficulty), so as to prevent the little fish from getting out, and any larger fish from getting in ; otherwise good results will seldom follow. The largest fish obtainable should be procured ; the first expense being perhaps greater, but proving in the end less, and a greater security from cannibalism. Well-fed yearlings should run from four to seven inches in length, some may be even more, and these are to a greater extent capable of 'holding their own' against larger fish than the small-sized yearlings bred in some waters, and are therefore worth much more money.

Salmo Fario (English brook trout) must take the precedence of all the other varieties, as it is the indigenous fish to most

English waters, and is well deserving of best position on account both of its sporting and edible qualities. In the warmer waters of the South it often attains to a great size, and is caught with the fly up to seven and eight pounds weight, still heavier fish being occasionally taken.

S. Fontinalis (American) is a lovely fish. It has only one fault, viz. that of travelling down stream, and on this account it has ceased to be the favourite it used to be in England a few years ago. The fish appears to be best suited to cold ponds in this country; in several places it has become well-established, and is bred from every year. The only thing required is very careful fencing. Fish of this species are not so active or strong as the English fish found in the same water, and not better eating. Another objection I have often heard lately is that they do not rise well at a fly; but this holds good as to the other varieties also when plentifully supplied with alternative food.

S. Levenensis (Loch Leven trout) is undoubtedly a fine fish. When caught in its own beautiful loch there is no better fish either for sport or table; whether it will preserve these characteristics in other waters seems to be a question of food only; it thrives in the South of England in either lake or stream. I have myself a very high opinion of *Salmo Levenensis*, and rear them in considerable numbers every year, their growth being very rapid in my water. I get my ova, of course, from the Howietoun fishery. In which class *S. Levenensis* is to be placed, is perhaps for more scientific men to decide; my suspicion is it is merely a local variety of *Salmo Fario*.

S. Ferox (Great Lake trout) do well in very deep waters, and grow there to a large size; they are usually obtained from the famous fishery at Huningue, or from Herr F. Zenk, Würzburg, in Germany.

Thymallus Vulgaris (Grayling) are worth greater cultivation in the streams of the South of England, if only on account of their being in season after trout-fishing is over, thus affording a most welcome extension of time to anglers. There is less

difficulty in breeding grayling artificially than was formerly supposed. The principal risk is owing to their spawning operations being got through in such a short time. If the right day is missed, the fish may have finished, and no ova can be obtained. Young grayling can be reared in nursery ponds with as little trouble as trout, and they thrive on exactly the same food.

It remains to give a caution against over-stocking, which, as a practical writer truly observes, will produce 'a sort of permanent famine.' A stream should never be fully up to its possible 'limit in regard to stock, a little under will give you bigger and better fish.' At the same time it is an undoubted fact, that there are very many waters which (if managed properly) would contain with perfect safety ten times the number of fish they now do.

Let me, in conclusion, draw attention to some of the enemies of trout.

In the natural state the parent fish devour the ova as soon as it is deposited. Only to-day I saw a pair of *Fontinalis* about four pounds each on the spawning beds, and watched them for some minutes. Every time the female deposited a few eggs, both she and her 'consort' turned round and devoured them instantly. Yearlings and older fish lurk in the vicinity of the spawning grounds, and devour every egg they can find. Swans,¹ geese, wild and tame ducks, moor-hens, dab-chicks, cootes, cattle and rats, rout about the spawning beds, and the later spawning fish disturb the 'redds' previously made. Nature is bountiful enough to provide for considerable waste, but this is no reason why art should not step in and reclaim it. It is only in places possessing a *very large extent* of natural spawning and rearing ground that any great number of store fish are to be found. In some of the finest reaches of water one sees but a few dozen yearlings to replenish the river by-and-by; the natural consequence of this being, that in two or

¹ A swan will devour the best part of a gallon of trout ova in a day, say, 40,000 eggs.

three years' time, the water contains but a very limited number of fish, or, as the phrase goes, 'is not so good as it used to be.' In many instances it is not possible to *make* either spawning or rearing grounds, and the fishery either becomes valueless, or the proprietor has to re-stock the river by artificial breeding.

Perhaps the most formidable enemy to a trout is the 'up-right form' in the shape of man. A much greater tax is levied on the stream in these days on account of the greater number of persons who practise the 'gentle art,' and the water is unreasonably expected to yield more sport, although no measures are taken to increase its breeding or feeding capacity.

Liberal as the proprietor of a trout stream frequently is in granting permission to fish to strangers, it is a great mistake to allow so much freedom in the *number and size* of fish killed. Four or five brace of sizeable fish are ample for a day's sport, and none but a 'pot hunter' would grumble about a necessary and reasonable limitation. A limit should also be imposed as to the size under which fish should be kept—say from eleven to fifteen inches, according to circumstances—and all fish below that length ought to be honestly returned to the water. Years ago the case was different altogether; but now there are a hundred fishermen where formerly there was one. A pheasant breeder may reasonably (if he likes) allow his 'battue' days of a thousand or two thousand birds; but pheasants reach perfection in one season, and only sufficient breeders need be kept for the next. Trout, on the contrary, take four or five years in most waters to attain a killable size, and a too indiscriminate permission to fish, coupled with the absence of any restriction as to the number and size of fish allowed to a rod, are the ruin of many waters.

The protection of fish in all stages is necessary, but there is often great difficulty in 'preserving' the larger specimens. As soon as they are of an age to perpetuate their species, their instinct teaches them to travel up stream to find suitable spawning grounds, when many of them, going out of bounds, never get the chance of coming back again. It is at spawning time

also that poaching is systematically practised, as the fish are to be found in shallower water, when a slight knowledge by the poacher of the habits of trout will enable him to take almost as many fish as he wants. Greater loss occurs at this than at any other season, as not only the parent fish, but all their offspring are destroyed. Spawning grounds should be watched night and day, and good solid obstructions should be so placed in the river as to be effectual in preventing the working of nets.

Hatches, or water-gates, frequently leave no place for fish to hide, and if the poacher knows his business (as most of them do) he has only to shut down the gate, and the pool runs all but dry in a few minutes; the poacher pockets the fish, opens the gate, and takes his departure as quickly and quietly as he can, returning the next night probably to find another good haul of fish. Proprietors of streams, and also their keepers, are not always judicious in their attempts to 'secure' the fish to their own part of the water.

Weeds, instead of being ruthlessly eradicated, as is too frequently the custom, should be *judiciously* retained. With the wholesale destruction of weed goes the principal part of the fishes' food, and often the only hiding places the river affords.

A stream is sometimes cleared of weed so entirely as to resemble a well-kept carriage drive. The trout naturally seek a more secluded part of the water, and will no more remain where there is no *cover*, than would pheasants. If they stay, they become shy feeders, and as soon as one fish is startled by a footstep on the bank, he seems to communicate the alarm to others, as if by electricity, and the whole rush wildly up and down stream, causing mimic waves in the river for a hundred yards or more.

A certain number of fish are thus 'preserved' to the river, as the angler has not the slightest chance of getting within cast of them. The proprietor's wish of course is, that persons who have permission to fish should have fair sport: the fault lies principally with the millers and keepers, who find it easier to set a few men to clear the weeds right out, than to superintend

what is called 'judicious' cutting. Some river keepers think that their sole duty is to walk leisurely up the river once a day to look out for anglers—or for 'tips'?—but as for their preserving the fish in other and more effectual ways, there might as well be no keeper at all! On the other hand, there are keepers to whose knowledge and thoughtfulness the proprietor owes his valuable fishery.

Several such men are known to the writer, and have been 'on the water' all their lives, doing their duty thoroughly and fearlessly, whether the offenders be 'gentlemen' or poachers.

Millers say they cannot get the 'tail' water away from their wheels; and this, when true, is undoubtedly a loss of power to them: but a very little time spent in clearing weeds from certain spots would allow the water to pass, and at the same time retain 'hides' for the fish, and so encourage them to remain. There is such a thing as retaining *too many* weeds and thereby injuring sport to a great extent; but if weeds are left to grow in big patches, and only here and there a clear space cut, the fish are inclined to feed more boldly, being but a few feet away from a good 'holt.' It is the angler's fault or misfortune if he loses fish by allowing them to dive head first into a patch of weed.

The best fish and best sport are always to be had in a fairly weedy part of the stream.

By 'sport,' I do not mean great bags of fifteen or twenty brace, but good honest fights with a brace or two of *three or four pounders*, which have taxed all the angler's powers of patience and skill to bring to bank. The after-dinner stories of a triumph over a 'real big one' afford a true sportsman more pleasure than the bragging of 'a basket full' taken on a day, and under circumstances, when the veriest novice could not fail to catch them if he kept his fly in the water.

THOMAS ANDREWS.

INDEX.

BAG

- 'BAGGITS,' 114
- 'Barren' salmon, 120
- 'Black' fish, 130
- 'Bladderwort,' fish-eating plant, 134
- Blow-line fishing with May fly, 391
- Boat, portable india-rubber, 108
- 'Botling,' 162
- 'Buddagh,' 171
- Bull trout (*Salmo eriox*), 148-152
 - distinctive marks of, 155-158
 - in the Tweed, 150
 - other localities, 151
 - worm fishing for, 352-361

CASTING LINES, 33

Chalk-stream fishing with the dry fly, 330-345

Charrs, 164

'Clean' salmon, 120 . 132

Coquet trout, 151

Creels and fish carriers, 92-97

'Creeper' and stone-fly fishing, 389-391

DETACHED-BODIED flies, 334-345

Distinctive marks of salmon, 157

Dressing lines, 52

Dry-fly fishing for trout, 330-345

FIS

'FINE AND FAR OFF,' or trout and grayling fishing with the fly, 257-329

'Fine fishing,' 3

'Finnock,' 154

Fish culture, trout and salmon, 434-465

Fish-eating plant, 134

Fish food, nutritiveness of various, 166-169

Fishing tackle and gear, 1-109

'fine fishing,' 3

salmon hooks, 4

looped and eyed, and fastenings for, 4-12

gut loops to, 9

Pennell-Limerick bend, 12

defective bends, 15

triangles, 15

double, 17

double barbs, 18

'sliced hook,' 18

trout hooks, 18

Pennell 'old' bend, 19

round bend, 19

Limerick bend, 20

Hall's eyed hooks, 20

Knot for, 21

needle-eyed hooks and fastening for, 22

'Jam knot' attachment for, 25

FIS

Fishing tackle and gear—trout hooks (*cont.*):

turned-down loops recommended, 27-32

'Pennell-sneck' bend, 29

'Pennell-Limerick' bend, 32

enamelled rust-proof, 33

bronzed, 33

gilt and coloured, 33

casting lines, 33

gut making, 33

selection of, 35

'drawn' gut, 38

knots and knotting, 38

single 'fisherman's knot,' 39

knots for drop flies, 39

the 'Buffer' knot, 40-42

double 'fisherman's knot,' 43

twisting gut lines, 43

plaited gut lines, 44

stains for gut, 44-47

staining hair, 47

reel or 'running' line, 47

silk and hair, 47

hair, 48

silk, plain, and hemp, 48

'dressed,' 49

tapered, 50

'swelled,' 50

with wire centre, 52

winding new lines on reel, 51

receipts for dressing, 51

best length of line for salmon fishing, 59

reels, 52

Malloch's 'Sun and Planet' reel, 52

Malloch's 'casting reel,' 53, 54

Slater's 'perfect combination reel,' 55

Anderson's 'Excelsior' reel, 56

Watson's reel, 57

FIS

Fishing tackle and gear—reels (*cont.*):

Farlow's 'Lever' reel, 58

weights of reels, 60

aluminium reels, 60

gun-metal reels, 60

'plain,' 'check,' and 'multiplying' reels, 61

defects in reels, and remedies, 61

line-'hitching' preventor, 62

reel fastenings, 62-64

Hardy's wedge fastening, 63

salmon and trout rods and woods for making, 64-72

split-cane, 65

steel-centre, 68

best length of, 68

trout rods, 70

single-handed, 70, 71

double-handed, 71

split-cane, 70

lady's, 71

joint fastenings, 73-78

Irish joint, 73

Watson's waterproof joint, 75

Anderson's 'Simplex,' 75

Farlow's, 77

Hardy's 'Lock-fast,' 77

landing nets and gaffs, 78-92

net or gaff, 78

portable nets, 79-82

portable gaff, 82

pocket gaff, 82

the art of gaffing one's own fish, 83

anecdotes of, 83-86

poaching 'confessions,' 85-88

fishing for a breakfast, 89

maxims for the 'gaffer,' 92

correct and incorrect form of gaff, 91

FIS

- Fishing tackle and gear (*cont.*):
 fish carriers, 92-97
 bags, 93-95
 creels or baskets, 95-97
 wading boots and trousers, 97-102
 experiments with, 99
 life-belt wading trousers, 101
 boots and stockings, 102
 lady fishers and dress, 102-105
 waterproofing for fishing coats, &c. 106
 fishing etceteras, 106-109
 knife for fly fishers, 107
 portable india-rubber boat, 108
 Mr. Eardley Holt's clearing knife, 109
 Flies, rubber and horsehair-bodied, 334-345
 Fly fishing for salmon, 178-255
 'Fly protector,' 25
 Food of salmon in the sea, 141
 'Foul' fish, 114
 'Fresh-run' salmon, 115
 Fresh water, salmon confined in, 145
 GAFFING, the art of, 83. 92
 anecdotes of, 83-86
 Gaffs and landing nets, 78-92
 'Gillaroo' trout, 161
 Grayling, fishing with the fly, 311-314
 bait fishing for (artificial grass-hopper, &c.) 314. 394-409
 location and 'acclimatisation,' 317. 395-401
 Great Lake trout (*Salmo ferox*):
 fishing for, 368-375
 distribution of, 171
 'dolachans,' 171
 night feeders, 172
 large specimens, 176
 distinguishing marks of, 163. 177

LAK

- 'Grey trout,' 171
 Grilse, 141
 Gut and gut making, 33-38
 twisting and plaiting, 43
 staining, 44. 47
 knots, 'fisherman's,' 'buffer knot,' &c. 38-42
 for drop flies, 39
 HAIR, staining, 47
 'Hirling,' 154
 Horsehair and india-rubber-bodied flies, 334-345
 Hooks:
 salmon hooks, 4-18
 looped and eyed, 4-12
 double and triangles, 15-18
 'Pennell-Limerick' bend, 12
 trout hooks, 18-33
 round bend, 19
 Limerick bend, 20
 Hall's eyed, 20
 Needle-eyed and attachment, 22
 'jam-knot' attachment, 25
 Pennell 'old' bend, 19
 ,, turned-down loops, 31
 ,, sneck bend, 29
 ,, Limerick bend, 32
 rust-proof and bronzed, 33
 gilt and coloured, 33
 JOINT fastenings, new and old, 73-78
 'KELTS,' 132, 133
 'Kippers,' 114
 Knife for fly fishers, 107
 Mr. Eardley Holt's clearing, 109
 LADDERS, salmon, 122-129
 Lady fishers, and dress, 102-105
 Lake flies, standard patterns, 281-284

LAK

Lake spinning for trout, *fario*,
ferox, &c. 368-375

Lake trout (Great) *Salmo ferox*
(*vide* Great Lake trout), 171-
177

Landing nets and gaffs, 78-92
Lernæa salmonis, 132

Lines :

reel lines, 47-51

silk and hair, 47

hair, 48

silk, 'plain,' and hemp, 48

dressed, 49

tapered, 49

'swelled,' 50

wire-centred, 51

winding on reel, 51

dressing for, 52

best length for salmon fishing,
59

'Loch Leven' trout, 160

MAY-FLY fishing with the blow
line, 391

Migration of salmon divided or
irregular, 114 . 120

Minnow spinning for trout in
streams, 375-382

'OLD SOLDIERS,' 131

PARR MARKS, 139

'Phinnock,' 154

Poaching 'confessions,' 85-88

Prawn or 'shrimp bait' for sal-
mon, and tackle, 361-368

'RED FIN,' 154

'Red' fish, 130

Reel or 'running' lines, 47-51

Reel fastenings new and old,
62-64

Reels (*see* Tackle and Fishing
Gear), 52-62

Rivers, early and late salmon, 115

SAL

Rods :

salmon rods, and woods for
making, 64-72

split-cane, 65

steel-centre, 68

trout rods, 70, 71

split-cane, 70

single-handed, 70, 71

double-handed, 71

lady's, 71

SALMON : natural history of,
110-148

proved facts in history of, 112
nomenclature, 114 . 120

irregular or 'divided' migra-
tions, 114 . 120

„ illustrated in case of
trout, 121

ascent of, from the sea,
115 . 119-121

'fresh-run' fish, 115

rivers, early and late, 115-117

best holding grounds for, 117

'barren' fish, 120

'clean' fish, 120

leaps, 121

ladders, 122-125

„ floating, 125-129

spawning of, 130-132

'red' fish and 'black' fish,
130

combats of, 131

'old soldiers,' 131

'kelts,' 'spent' or 'unclean'
fish, 132

return to sea after spawning,
132

re-ascent as 'clean fish,' 133

increase in weight, 133

'well-mended kelts,' 133

hatching eggs, 133-138

destruction of young fry, 134-
138

growth of young fry, 139

SAL

- Salmon : history of (*cont.*) :
 'Parr marks' and colours of,
 139
 change of parr into smolts, 140
 smolts migrate to sea, 140, 141
 return as grilse, salmon, &c. 141
 increase of weight, 141
 habits and food in sea, 141
 large specimens on record, 143
 confined in fresh water, 145
 distinctive marks, as compared
 with bull trout and sea trout,
 155-158
 Salmon fly fishing, 178-255
 notes on history, &c. 179-186
 rods, 186
 reel and line, 188
 dressing for lines, 191
 casting lines, 193
 Mr. Pennell's 'buffer knot,' 194
 flies, 197
 standard flies, 207-223
 casting, 224-234
 working the fly, 234
 how to fish a pool, 235
 striking a rising salmon, 237
 playing a salmon, 240
 gaffing and landing, 245
 miscellaneous, 248
 Salmon-fishing, other than with
 the fly, 346-368
 spinning for, baits and tackle,
 346-352
 worm fishing for, and tackle,
 352-361
 prawn or 'shrimp bait,' and
 tackle, 361-368
 Salmon and trout culture (arti-
 ficial), 434-465
 the 'hatchery,' 436
 collection of eggs, 440
 impregnation of eggs, 442
 treatment of eggs, 445
 rearing of fry, 450
 natural food, 454

TRO

- Salmon and trout culture (*cont.*) :
 ponds, 456
 on stocking, 460
 Salmon trout (*vide* Sea Trout),
 152-158, 368-375
 SEA TROUT or salmon trout,
 natural history, notes on,
 152-158
 distinctive marks of, from sal-
 mon and bull trout, 155-
 158
 ditto, from brown trout, 153
 distribution of, 154
 confined to fresh water, 145 .
 154
 large specimens, 154
 local names of young, 154
 fishing, with fly, and spinning
 for, 254 . 368-375
 'Shedders,' 114
 'Shrimp bait,' or prawn, for
 salmon, 361-368
 Smolts, change of parr into, 140,
 141
 Spawning of salmon, 130-132
 'Spent' salmon, 132
 Spinning and bait fishing for
 salmon and trout, 346-393
 Spinning for salmon : baits and
 tackle, 346-352
 Spinning for trout in lakes, 368-
 375
 Stone fly and 'creeper' fishing,
 389-391
 Stream minnow spinning for
 trout, 375-382
 TACKLE and fishing gear, 1-109
 Thames trout fishing with fly
 and spinning bait, 410-433
 Thames trout, large specimens,
 165
 Trout (*Salmo fario*), common
 or yellow trout, notes on
 history of, 159-171
 distinguishing marks from sea
 trout, &c. 153

TRO

- Trout, notes on history of (*cont.*):
 distinguishing marks from
 Great Lake trout, 163
 distinguishing marks from
 charrs, 164
 variations in colour, 159
 'Loch Leven' variety, 160
 'Gillaroo' variety, 161
 'Botling,' 162
 deformed, 162
 croaking, 162
 large specimens, 164-166
 growth rate, and various foods,
 166-169
 spawning time, and growth of
 fry, 170
 Trout-fishing, lake spinning for,
 368-375
 May-fly fishing with blow line,
 391
 stream minnow spinning for,
 375-382
 worm fishing for, 382-388
 creeper and stone fly fishing,
 389-391
 wasp grubs, &c. 392
 Trout and grayling fishing with
 the fly, 257-329
 introductory, 257
 'fine and far off,' 258-270
 up or down stream casting,
 269-273
 artificial flies, 273-292
 ,, flies, 'exact imita-
 tion' theory, 277 . 332
 standard flies, 281
 lake trout flies, 281-284
 river and stream flies, 284-292
 'temporary' flies, 290

YEL

- Trout and grayling fishing (*cont.*):
 'local' flies, 291
 management of rod, line, and
 flies, 293-295
 landing and playing, 295
 breeding and feeding trout,
 295-311
 hints on tackle, dress, &c.
 319-323
 good and bad weather and
 water, 323-328
 last words, 329
 chalk stream fishing with 'dry
 flies,' 330-345
 grayling fishing and flies, 311-
 314
 ,, artificial grasshopper
 and bait fishing,
 314 . (394-409)
 ,, location and 'accli-
 matisation,' 317
 Trout and salmon culture, arti-
 ficial, 434-465
 ULLSWATER trout, 171
 'Unclean' salmon, 132
 WADING BOOTS and trousers,
 97-102
 Wasp-grubs &c. for trout fishing,
 392
 Waterproof for fishing coats, &c.
 106
 'Well-mended kelts,' 133
 Worm fishing for salmon and
 bull trout, new tackle, 352-361
 Worm fishing for trout, 382-388
 'YELLOW FIN,' 152

